JAN. 28
1960

ENGINEERING NEWS-RECORD

85TH ANNUAL REPORT AND FORECAST

No Push-Button Boom

- **Despite the widespread predictions for a booming economy in 1960, no one in construction should count on booms being push-button affairs.**

- **Booms are made — or unmade — by people. Also, people can make good booms and bad ones. It all depends.**

- **It depends on what people do — the people who are construction's clients — in private business and in government. But it also depends on what construction people themselves do.**

- **In 1960 construction needs a boom that will last, not just blast off and burn out. Specifically, it should be a boom that is consciously fashioned by intelligent planning, wise bidding and cost-cutting construction.**

- **These are the ingredients that will make construction boom in the year ahead — and keep it healthy enough to boom again. Their importance is highlighted by this 85th annual survey.**

ENR's Forecast for '60 starts on page 53

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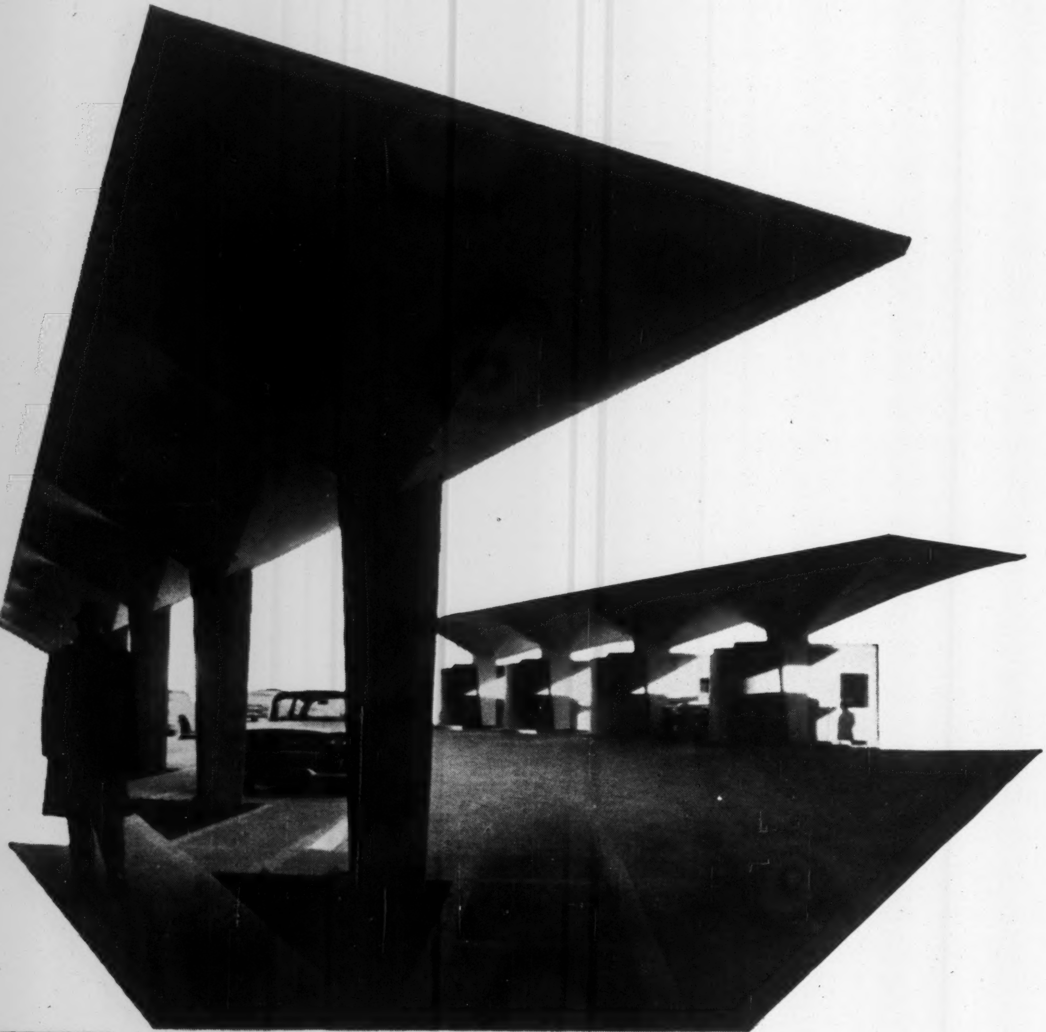
Iowa-Des Moines National Bank's new drive-in office turns a banking chore into a pleasure. Its functional design enables bank customers to conduct their business "on-the-run", saving time, temper and parking fees. ¶ This utility has been achieved through concrete, the modern building material that molds itself to the most exacting requirements of today's leading architects and builders. ¶ Penn-Dixie cement was used in the construction of Des Moines' newest bank.



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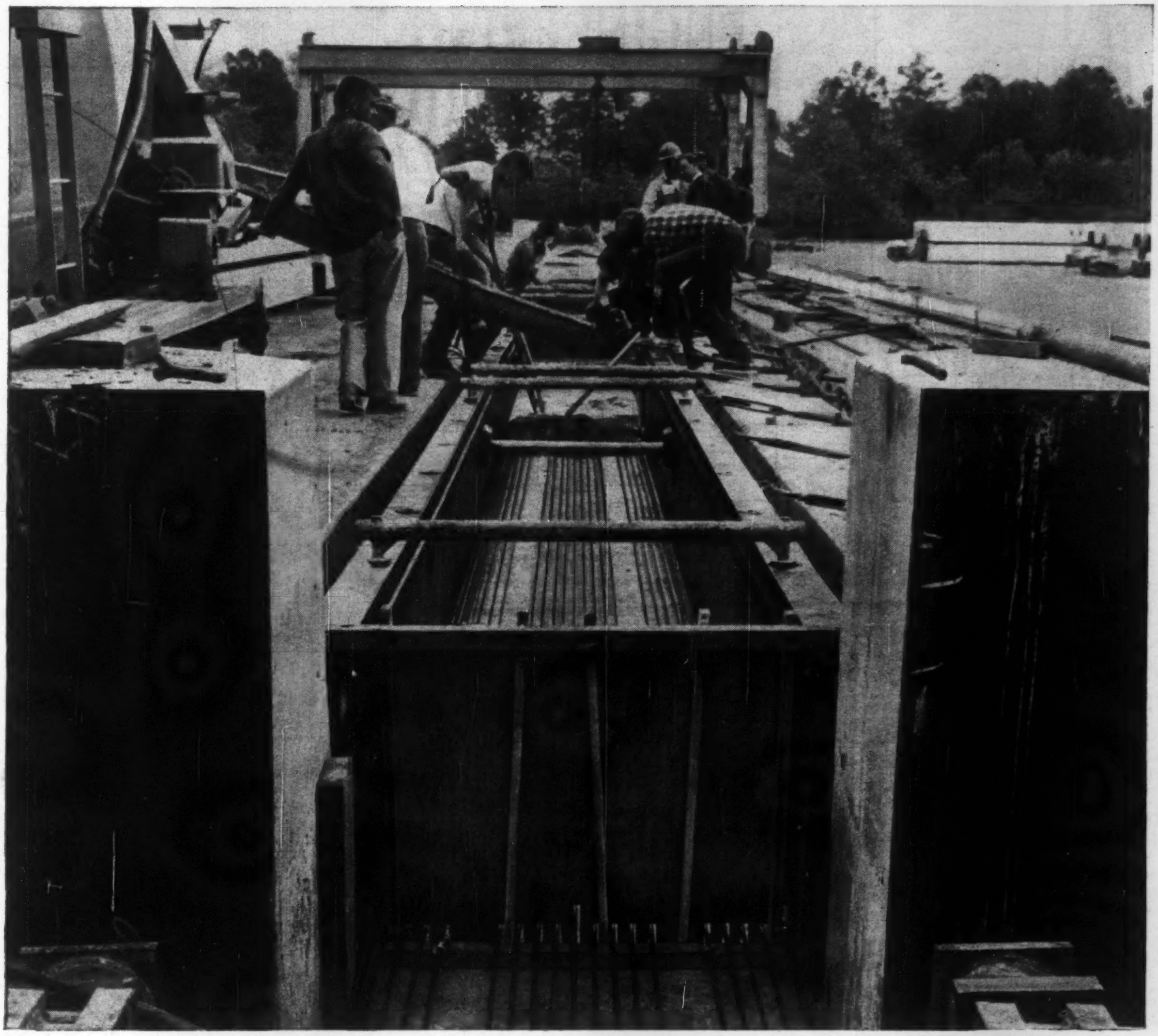

Box beam manufacturer likes uniformity of Bethlehem Stress-Relieved Strand

This on-the-job photograph, taken at Eastern Pre-stressed Concrete Corp., Line Lexington, Pa., shows the arrangement of Bethlehem Stress-Relieved Strand in box beams. The beams were 68 ft long, 48 in. wide, and 33 in. deep. The initial stress induced was 14,500 lb per strand, using a 47-strand pattern with 3/8-in. strand.

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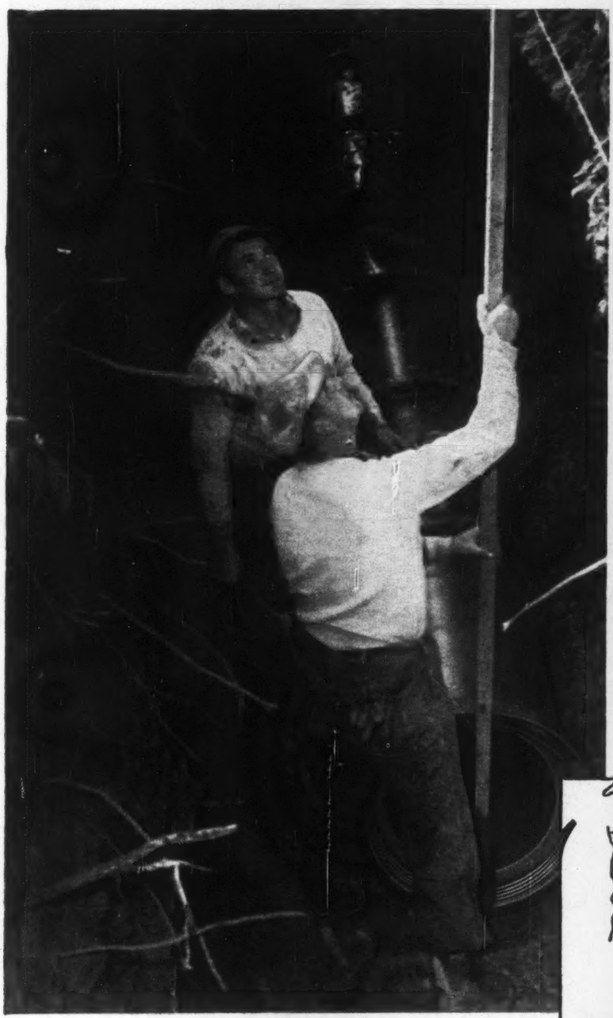

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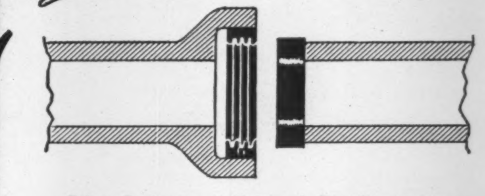

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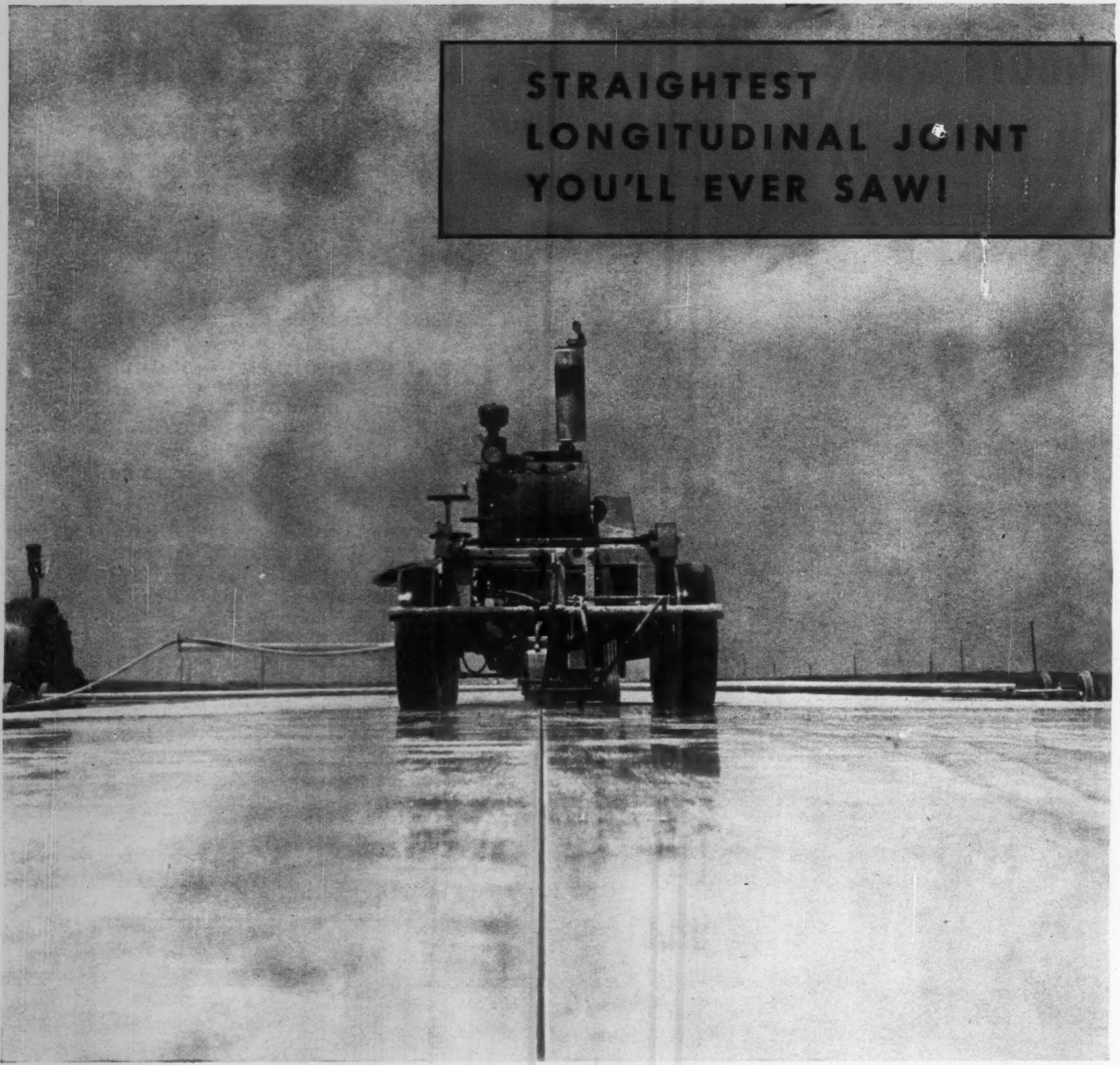
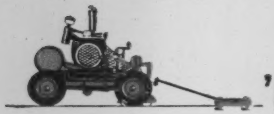


U. S. Highway No. 10 near Tappan, North Dakota. Northern Improvement Company, Contractors.



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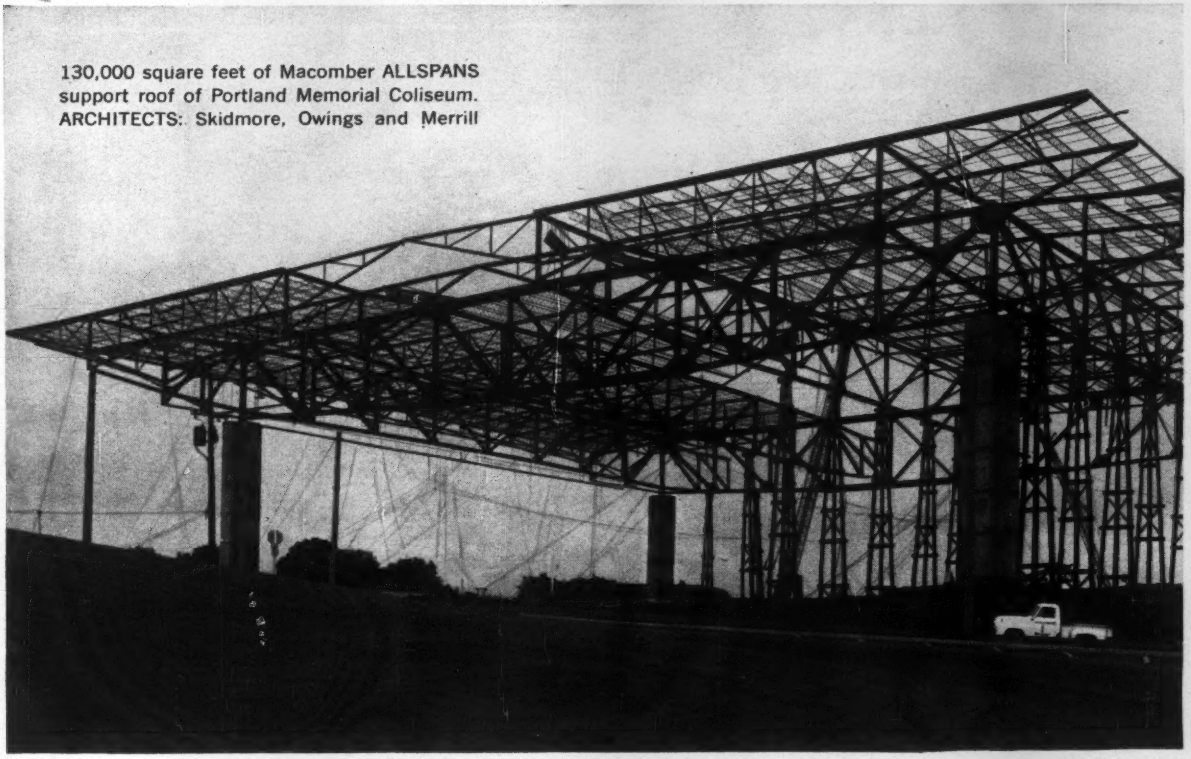

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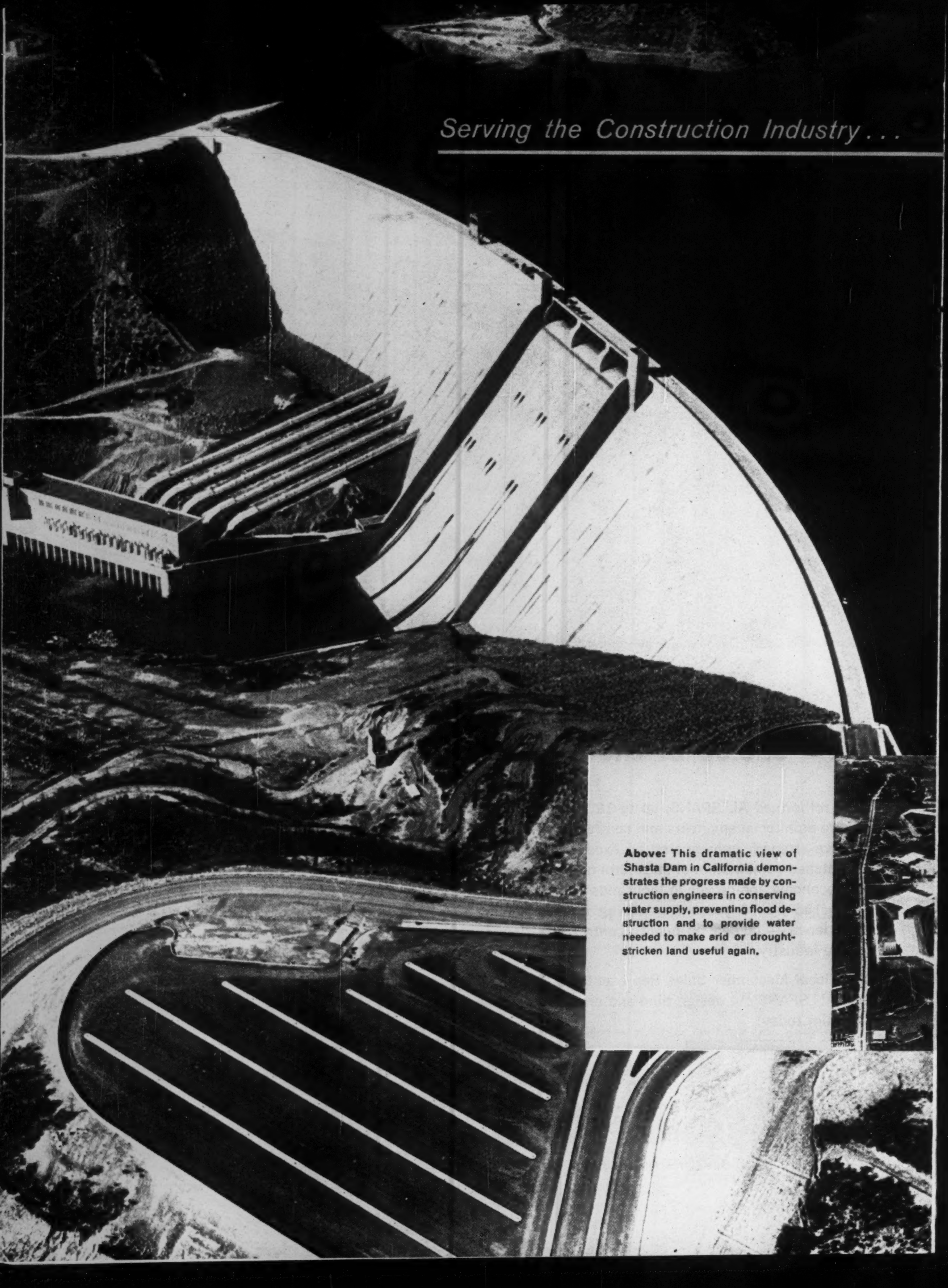

Above: This dramatic view of Shasta Dam in California demonstrates the progress made by construction engineers in conserving water supply, preventing flood destruction and to provide water needed to make arid or drought-stricken land useful again.

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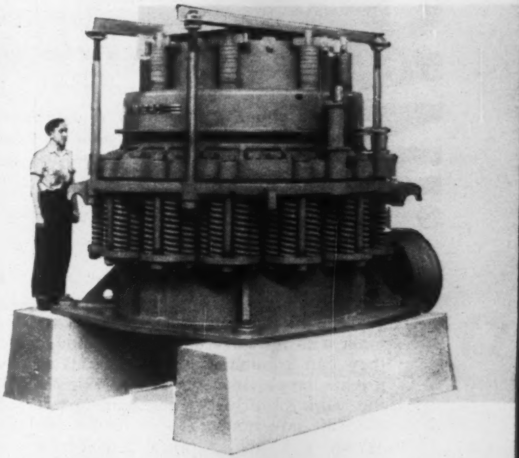

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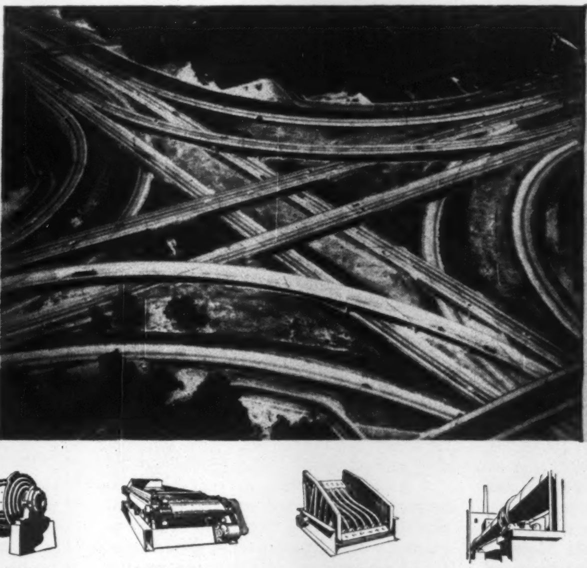

Far left: To meet the challenge of the jet age, engineers and contractors are being called upon to build and expand airport runways to handle the ever-increasing traffic. (View shows Lambert Field, St. Louis).

Left: This view of one of the interchanges on the high speed Detroit expressway is a striking example of the contribution the construction industry is making to the tremendous highway expansion program.

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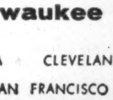

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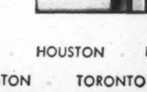

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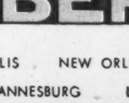

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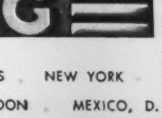

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Reader Comment

In Defense of Government Engineers

Editor's Note: Private consultants and state highway engineers disagree over who does the better work cheaper. In a letter to ENR last month, consultant Donald A. Walsh took a few swings at state engineers. The replies, which came quickly and in volume, appear in this section. But that hardly ends the argument, because consultants fear they are being frozen out of government work (see p. 41).

SIR—As a consulting engineer, I agree wholeheartedly with the idea that design of public works ought to be accomplished in the main by private consulting firms. But I disagree completely with the premises on which Mr. Walsh bases that conclusion (ENR Dec. 10, 1959, p. 6).

Some of the most competent, dedicated engineers in this country are in government service. Many of them remain with the government even though they can command higher salaries in private employment. Having reviewed the work of private consultants while with the government, I can assure Mr. Walsh that the nation's engineering competence is not centered entirely in private offices.

I favor the use of private consulting organizations primarily because of the greater flexibility possible in their operations. This is because they are not subject to the rules, regulations and red tape that are inherent in large governmental organizations. These rules and regulations are established in general to protect the public from the chicanery of a few. I, for one, think that much of the red tape is unnecessary. But in most cases it is outside the power of those who deal with private consultants to change the system.

We need good engineers in governmental agencies. By the very nature of government they must review the work of private consultants. They must provide criteria. In addition, I think that a part of the design of public works ought to be done by government employees. How else can they maintain the proficiency needed to administer large public programs?

Mr. Walsh is apparently afraid of Socialism. I am too. For that reason, I do not consider it an obligation of the government to support private consultants.

ROBERT E. CRON, JR.
Executive Vice President
Erdman, Smock, Hosley & Cron, Inc.
Phoenix, Arizona

▶ Mr. Donald A. Walsh's concern for financial fortunes of his Meissner Engineers, Inc., has hindered his judgment regarding engineers in government employ and aids those who would make engineering something other than a profession. The use of quotation marks to set off scurrilous charges, the oft heard calumny about the ineptitude of government engineers and the supercilious posturing of the consultant has been well reported.

DANIEL JACOBS
Highway Engineer III
Dolton, Ill.

▶ I don't see that he defended anything, he only made a bigoted attack on government employees. I am surprised that you would even print a letter that contained so many derogatory and slanderous remarks, none of which are based on fact.

If Mr. Walsh thinks more governmental work should be given to consultants it is his privilege, even his duty, to say so. If he can present factual data to show that it is more economical, let him do that; but if his only ground for his belief is his prejudicial feelings, let him be quiet.

KENDALL C. FOX
U. S. Army Engineer District
Garrison, N. D.

▶ In spite of the rather lengthy letter I think a phrase from one sentence, and another whole sentence perhaps best illustrate Mr. Walsh's philosophy. I refer to the phrase, "time to engineers in private enterprise is money," and to the sentence, "If I sound bitter or critical, it is because I am."

His motivation appears to be monetary rather than professional. It is a quite apt illustration that the engineering profession is not a true profession, but a true business in the accepted sense of the word.

His wrath seems to be directed at the highway engineer in the various state governments, the system under which billions of dollars are created to do the very work that he designs. That system raises the taxes to provide for these tremendous projects, and, in turn, expends it through channels with many necessary, and some seemingly unnecessary safeguards.

I have spent several years both in heavy and highway construction with private contracting firms, and in governmental work. Based on my experiences, I find no unusual emphasis on productivity by private enterprise in relation to that developed by governmental workers. My acquaintance with various highway engineers indicates they are a very capable and conscientious group of men who are perhaps more dedicated in the true sense of the word than the type of engineer Mr. Walsh represents.

ROBERT W. BRANNAN
Toledo, Ohio

▶ Responsible members of the civil engineering profession will, I believe, question both the usefulness and the propriety of publishing such letters.

Mr. Walsh, by his contempt for the facts and his entirely unprofessional lack of restraint in expressing his views, has succeeded only in presenting to the public a distressing and disgraceful spectacle, in complete violation of the spirit of the ethics of his, and our, profession. No one, of course, will bear Mr. Walsh, personally, any ill will because of his opinions. However, many of us can and do resent their reiteration in the engineering press.

No civil engineer, least of all those employed by public agencies, can properly object to criticism from his fellows, provided it is fair, decently restrained in expression, and reasonably well informed. No one, furthermore, can bother to reply to the whimsical views of every disgruntled individual who may have access to a typewriter. I do feel, however, that grounds exist for the strongest resentment of the fact that ENGINEERING NEWS-RECORD has seen fit to publish emotional and irrational statements which express, in offensive language, contempt for an honorable, accomplished and highly respected segment of membership of the profession. This publication is thus in the position of engaging, purely and simply, in outright slander against a large segment of the profession.

(*Reader Comment continued p. 16*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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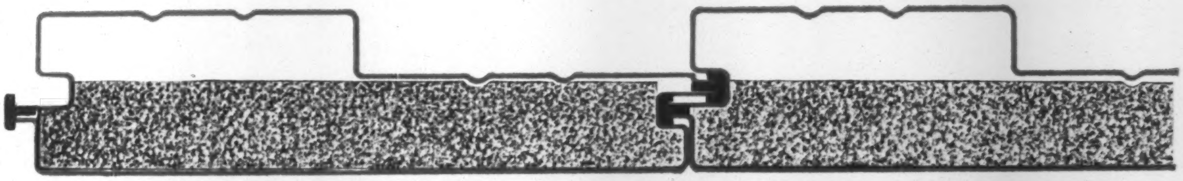

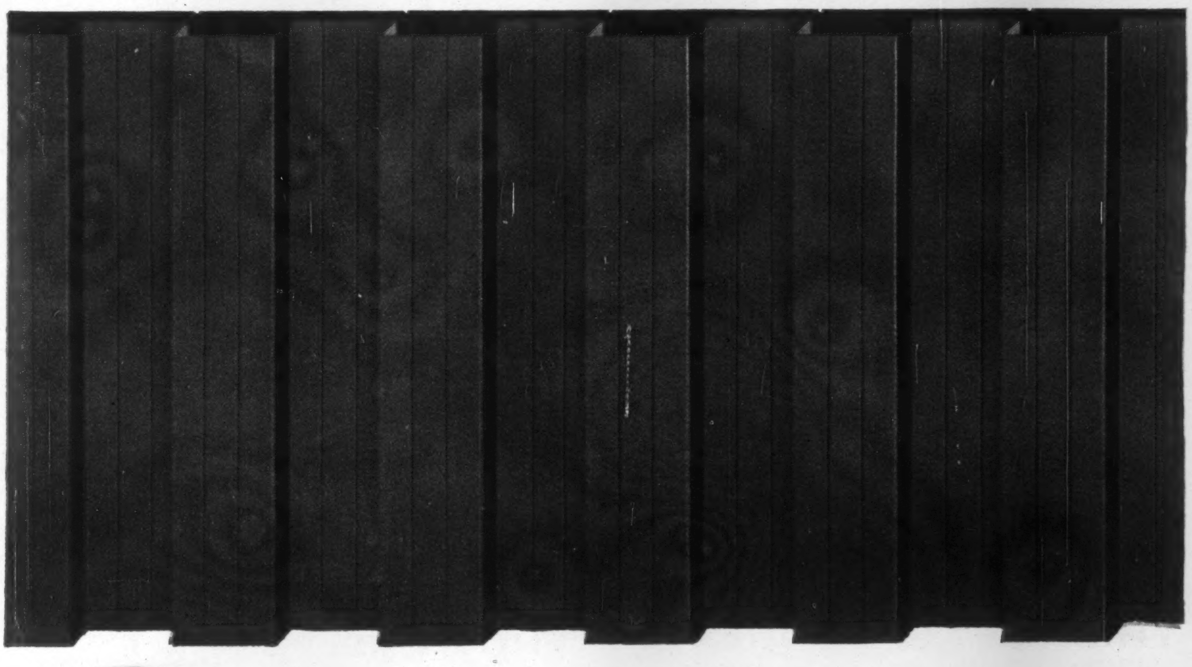

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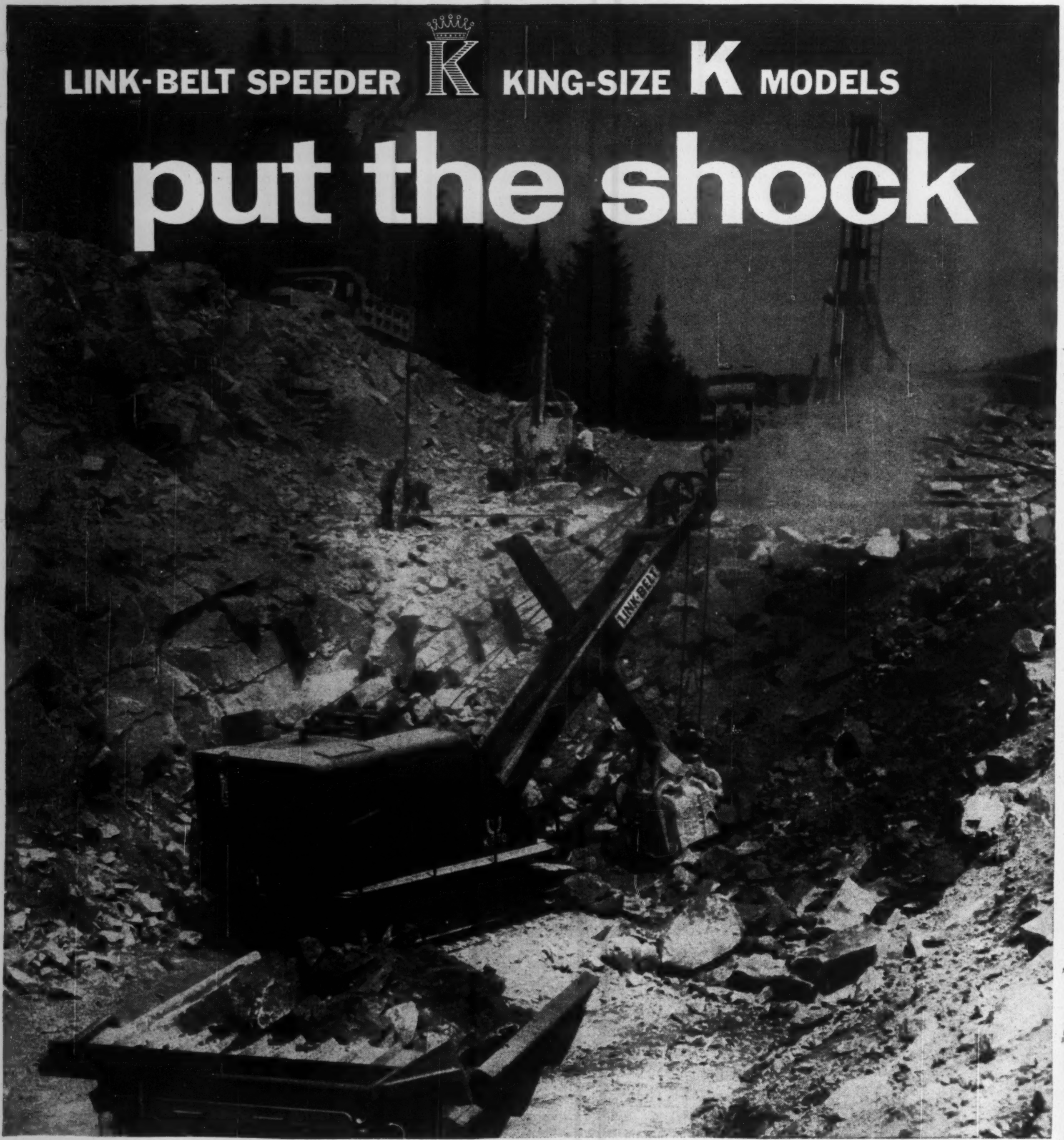
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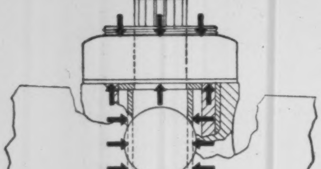
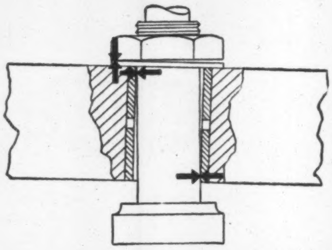
LINK-BELT

THIS—Link-Belt Speeder rotating base is trunnioned to the centerpin. Despite tilting action of the upper, there's perfect alignment of the centerpin and the bushing, plus full-length distribution of loadings to minimize stress and wear on centerpin.



NOT THIS—Without exclusive centerpin trunnion, tilting action of the base causes concentrated bending forces on the centerpin and prying action on the centerpin nut. Result is gouged centerpin bushing when swinging . . . repeated repairs.



in the rock...

come back for more!

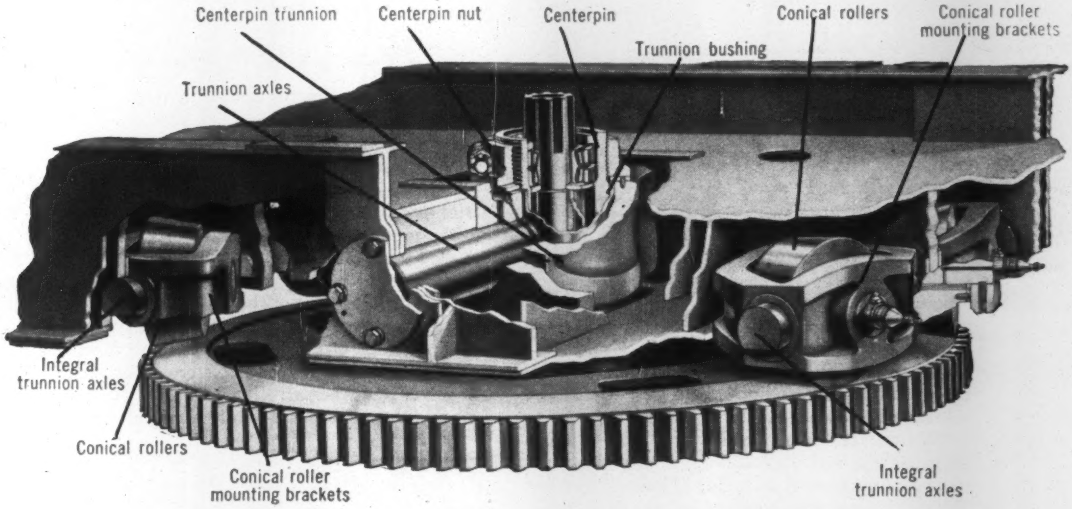
TOUGH CUTS OR BRUTE LIFTS, BURLY 1½ TO 3-YD. K-MODELS OUT-MANEUVER SMALLER RIGS . . . OUT-PRODUCE LARGER MACHINES!

Always on top of the heavyweight jobs! Your operator in the cab of a Link-Belt Speeder King-size K-model *knows* he need *never* baby this machine!

He feels the smooth surge of greater *usable* hp through hefty, extra-size shafts, gears and clutches. He socks the dipper in—rugged K-model structural members soak up the shock.

And K-models deliver these output-boosting advantages: Speed-o-Matic, the *true* power hydraulic controls . . . fast, effortless power hydraulic steer . . . *plus* bonus usable hp.

If you'd like more facts demonstrating how King-size K-models (1½ to 3-yd. capacity) outstrip the field, see your distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

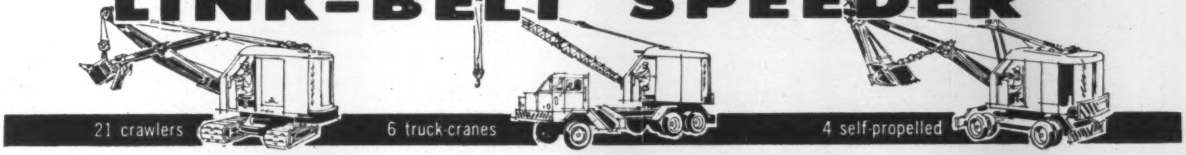

Centerpin trunnion
Centerpin nut
Centerpin
Conical rollers
Conical roller mounting brackets
Trunnion bushing
Trunnion axles
Integral trunnion axles
Conical rollers
Conical roller mounting brackets
Integral trunnion axles

Exclusive centerpin trunnion and oscillating roller design evenly distributes all loadings

The centerpin trunnion is mounted on two stub axles within the upper frame, permitting the upper to oscillate without any of the binding stresses common to other centerpin arrangements. All loadings are thus equalized with no prying action against the centerpin nut or bending stresses against centerpin and its bushing. Working hand in hand with centerpin design principle are the oscillating conical rollers. They are mounted within brackets that oscillate on stub axles, permitting full face contact of rollers with roller path at all times . . . no peening of roller edges or gouging of roller path.

15,231

LINK-BELT SPEEDER


21 crawlers
6 truck-cranes
4 self-propelled

It's time to compare . . . with Link-Belt Speeder

The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

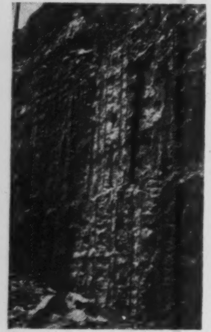
Notekeeper: W. & L. E. Gurley, America's Oldest Engineering Instrument Maker

Optical Plummet solves problem on Niagara Power Project

"Sometimes a seemingly little thing can make a big job easy," says Frank Dickey, Project Engineer on the Niagara Power Project for Channel Constructors—a joint venture of Peter Kiewit Sons' Co., Morrison-Knudsen Co., Perini Corp., and Walsh Construction Co.

"We had an unusual problem here on excavations for the 500-foot-wide channel which will handle the water for the new Niagara hydroelectric plant. The conduits will pick up water from the Niagara River a couple of miles above the Falls and carry it underground through the city to an open channel, reservoir and 2,190,000-kilowatt power plant located several miles down the river.

"The channel had to be cut from dolomite. We decided to line drill the full 105-foot depth at one time, using 6-inch diameter holes on 5-foot centers. It was our intent to line drill the entire job, some 1600 holes, before any of the excavation was finished to grade. This made it necessary to devise a method of checking the holes for plumb from the surface so as to be sure that they did not deviate enough to get outside the tolerance allowed by the specifications.



"We thought of several ways to do this but none very practical, until one of the men mentioned having used a Gurley Optical Plummet Transit on another kind of job up in Canada. We decided to try the 'bobless transit' here.

"We set up over the opening; then leveled the instrument with the North plate bubble over two opposing leveling screws. Then we sighted in the Optical Plummet and started moving the other two opposing leveling screws until we were able to pick up the light—by means of the 'OP'—from a dime store flashlight which had been lowered into the hole by a string.

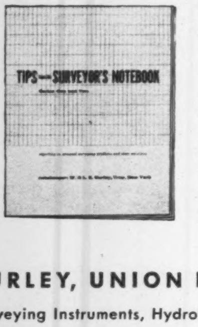
Frank Dickey (r.) checks Gurley Optical Plummet Transit on Niagara Power Project job.

"While moving the two opposite screws, we constantly checked the North plate vial to make sure that it remained level throughout the movement. After we picked up the light from down the hole, we moved the telescope until its bubble was in the center. When this was established, we read the vertical circle—this giving us the angle at which the hole had been drilled.

"This proved to be accurate and a fast system for checking the holes and undoubtedly gave us a better job than we could have otherwise obtained.

"This use of the 'OP' is a special case," Mr. Dickey added. "But I'll bet there will be many other jobs that the 'OP' can lick. For years I cussed the plumb bob, especially when the wind was blowing...always wished someone would do something about it."

You, too, can do something about the plumb bob problem. Gurley *built-in* optical plummets eliminate outmoded bobs...save set-up time...improve accuracy. *Bulletin OP-100 gives complete details on two models available.*



TIPS—SURVEYOR'S NOTEBOOK

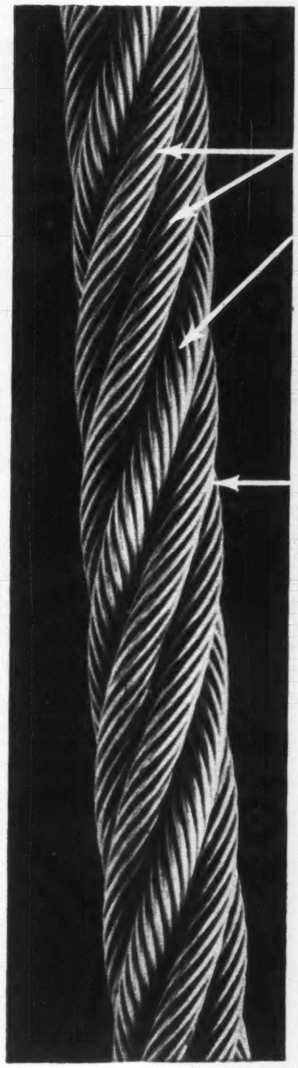
***"Tips from The Surveyor's Notebook"**: We have collected the most helpful, most discussed pages from Series One and Two of "The Surveyor's Notebook" in one 20-page book. These valuable field suggestions will help you use your own instruments with greater success. Write for your free copy.*

GURLEY

Surveying and Scientific Instrument Makers
Since 1845

W. & L. E. GURLEY, UNION PLAZA, TROY, N. Y.

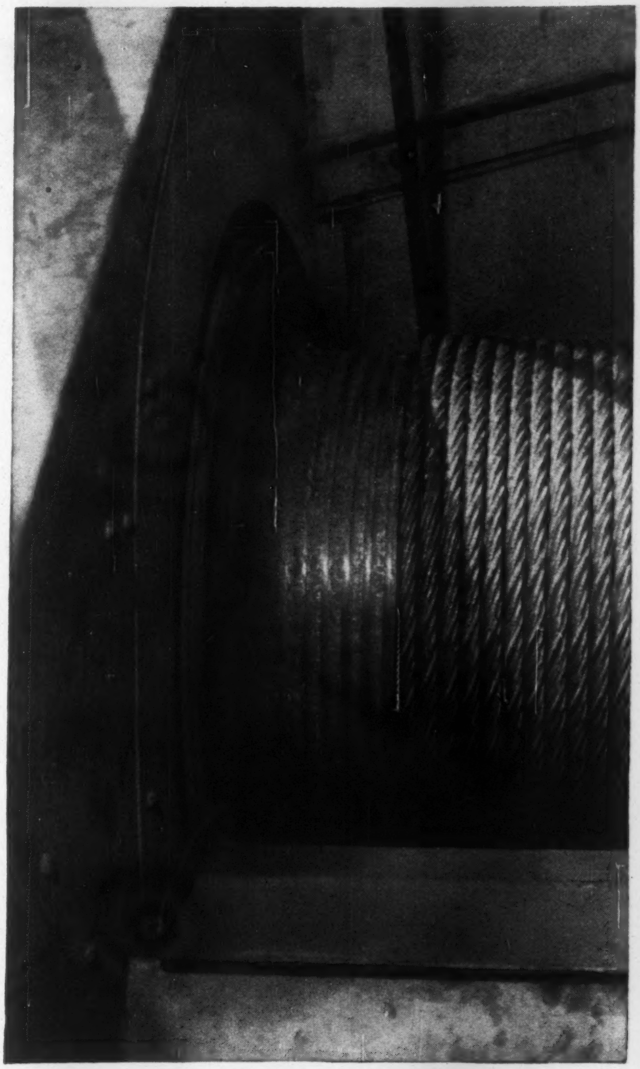
Engineering and Surveying Instruments, Hydrological and Meteorological Instruments, Paper Testing Instruments, Optical Instruments, Reticle Manufacturing Facilities, Standard Weights and Measures



Herringbone's two pairs of Lang lay strands and one pair of regular lay strands provide the ideal combination of maximum flexibility with good stability.

Finer wires inside contribute to Herringbone's excellent drum-winding characteristic.

Heavier outside wires in each strand have greater resistance to abrasion.



"...we would never hesitate to recommend it"

GRAY & FEAR, CONTRACTORS

This company continues: "We have been using your Roebling Herringbone* for about one year. We find it is one of the best ropes we have ever used, outlasting previous ropes three to one. It is good that such a reliable rope is available."

This is a direct field quote on the most remarkable development in wire rope in years...a new concept in wire rope design. Roebling Herringbone is the regular lay and Lang lay wire rope—two-ropes-in-one rope—combining the best features of both.

Herringbone delivers extra flexibility, extra abrasion resistance, unusual structural stability, extra resistance to shock, easy operation over sheaves and drums and smooth spooling properties.

We recommend Herringbone without reservation for general hoisting and the entire range of heavy-duty equipment. Your Roebling Distributor or Roebling's Wire Rope Division, Trenton 2, New Jersey, will give the full and fabulous details. *Reg. App. For

ROEBLING

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John A. Roebling's Sons Division
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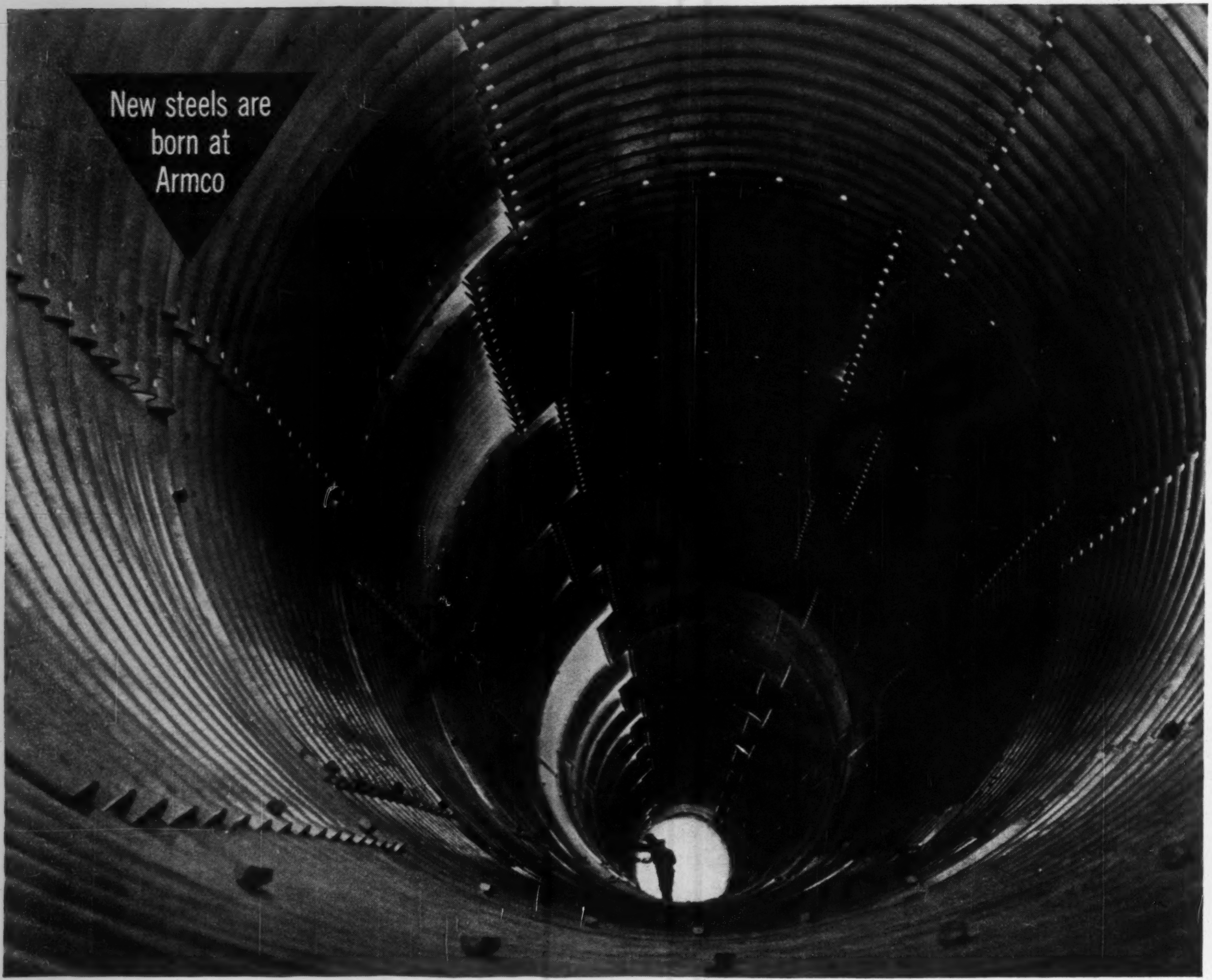
ROEBLING
HERRINGBONE
WIRE ROPE

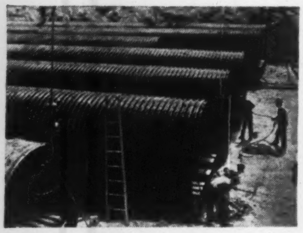
THIS BIG ARMCO



New steels are born at Armco

1

2



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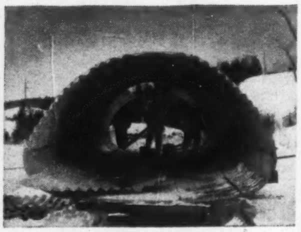
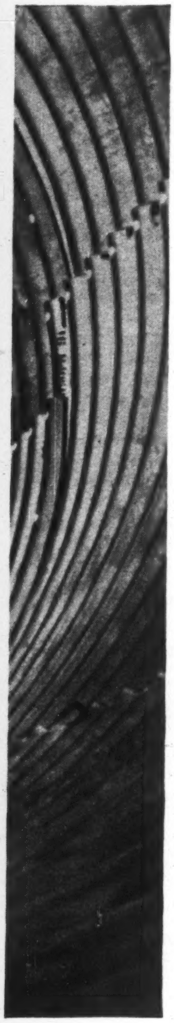


4

1. This conveyor tunnel is an Armco MULTI-PLATE Pipe. **2.** Easy-to-handle MULTI-PLATE sections are bolted together quickly. **3.** Battery of bituminous-coated MULTI-PLATE Structures provides large drainage area. **4.** Pipe-Arch is one of a variety of shapes of MULTI-PLATE Structures. **5.** MULTI-PLATE Pipe serves as pedestrian underpass in railroad yard.

DRAINAGE STRUCTURE



won't crack or break

Properly installed, an Armco MULTI-PLATE® Drainage Structure functions as a *single unit*—for good. The curved, corrugated plates are bolted together to make an integral structure. Transverse earth pressures can't disjoint it. Frost action won't crack it. Imposed loads will not break it. This means an Armco Structure will be as strong, as straight and as sound 20, 30, 40 or more years from now as the day it was installed.

Best of all, Armco MULTI-PLATE is the *most economical* answer for large size drainage structures, underpasses, conduits and similar needs, time after time. Actual job service records prove it.

You can get complete facts easily. Use the coupon for your copy of the Armco MULTI-PLATE Catalog. If you want to discuss the application of MULTI-PLATE to your specific problem, our representative will be glad to show you factual case histories. Armco Drainage & Metal Products, Inc., 4320 Curtis Street, Middletown, Ohio.

SEND FOR FREE CATALOG

TWENTY PAGES OF AUTHORITATIVE DATA

ARMCO
MULTI-PLATE

ARMCO DRAINAGE &
METAL PRODUCTS, INC.
Department E
4320 Curtis Street, Middletown, Ohio

Rush my copy of the Armco MULTI-PLATE Catalog.
☐ Have representative call.

Name______________________________

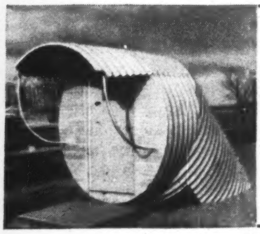
Title______________________________

Organization__________________________

Street or box number____________________

City____________________ Zone______

State______________________________



Armco MULTI-PLATE Structures are part of a complete line of corrugated metal drainage structures offered by Armco. Others include Armco Corrugated Metal Pipe and Pipe-Arch, SMOOTH-FLO® Sewer Pipe, and Perforated Subdrainage Pipe. MULTI-PLATE is used where large openings are required. Diameters range from 60" to 180".

ARMCO DRAINAGE & METAL PRODUCTS

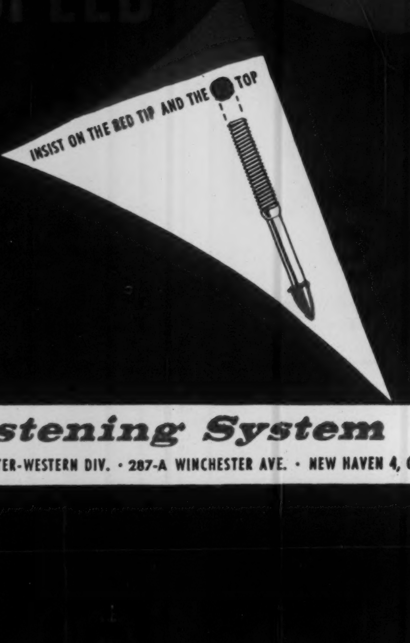
Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

leading contractors use Ramset

WHERE SPEED IS VITAL

Just a pull of the trigger and versatile Ramset tools set threaded studs, drive pins and other types of fasteners into concrete or steel without pre-drilling or plugging. Beside speed, versatility and one-hand operation, you can choose from industry's widest selection of fasteners and powder charges. Discover for yourself why Ramset is today's most widely used powder-actuated fastening system. Write direct or call your Ramset dealer, listed under "Tools" in the Yellow Pages.


INSIST ON THE RED TIP AND THE TOP

Ramset® Fastening System

OLIN MATHIESON CHEMICAL CORP. · WINCHESTER-WESTERN DIV. · 287-A WINCHESTER AVE. · NEW HAVEN 4, CONN.

Many among us, especially in the highway field, have worked both sides of this particular street, and many will continue to cross it, time and again. For the most part, such strongly held opinions represent professional bigotry in its purest form.

All of us can agree with one statement made by Mr. Walsh: that the consulting engineers of this country can point with pride to their achievements and record of performance. How, on the other hand, anyone calling himself a Civil Engineer can behold—for example—the bridge over the Carquinez Straits, and respond to this noble and inspiring sight with nothing more than a renewed surge of revulsion and contempt for those of his colleagues who have conceived and designed it, must, I confess, remain a mystery and an object of wonder, at least to me.

What I suggest, and that strongly, is that we have had enough of calumny and abuse in the pages of the engineering press by irresponsible elements of the profession. Would it be too much to expect that further comment on this subject, however critical of any segment of the profession, be of a responsible nature, informed, enlightened and impartial, and set forth in language that is reasonably consistent with ordinary standards of courtesy and with the ethics of a respected profession?

R. B. Cocroft, Jr.
Bridge Design Engineer
Bureau of Public Roads
Arlington, Virginia

▶ It is indeed regrettable that Engineering News-Record has seen fit to print an ill advised, intemperate, and inaccurate assault upon our state highway departments.

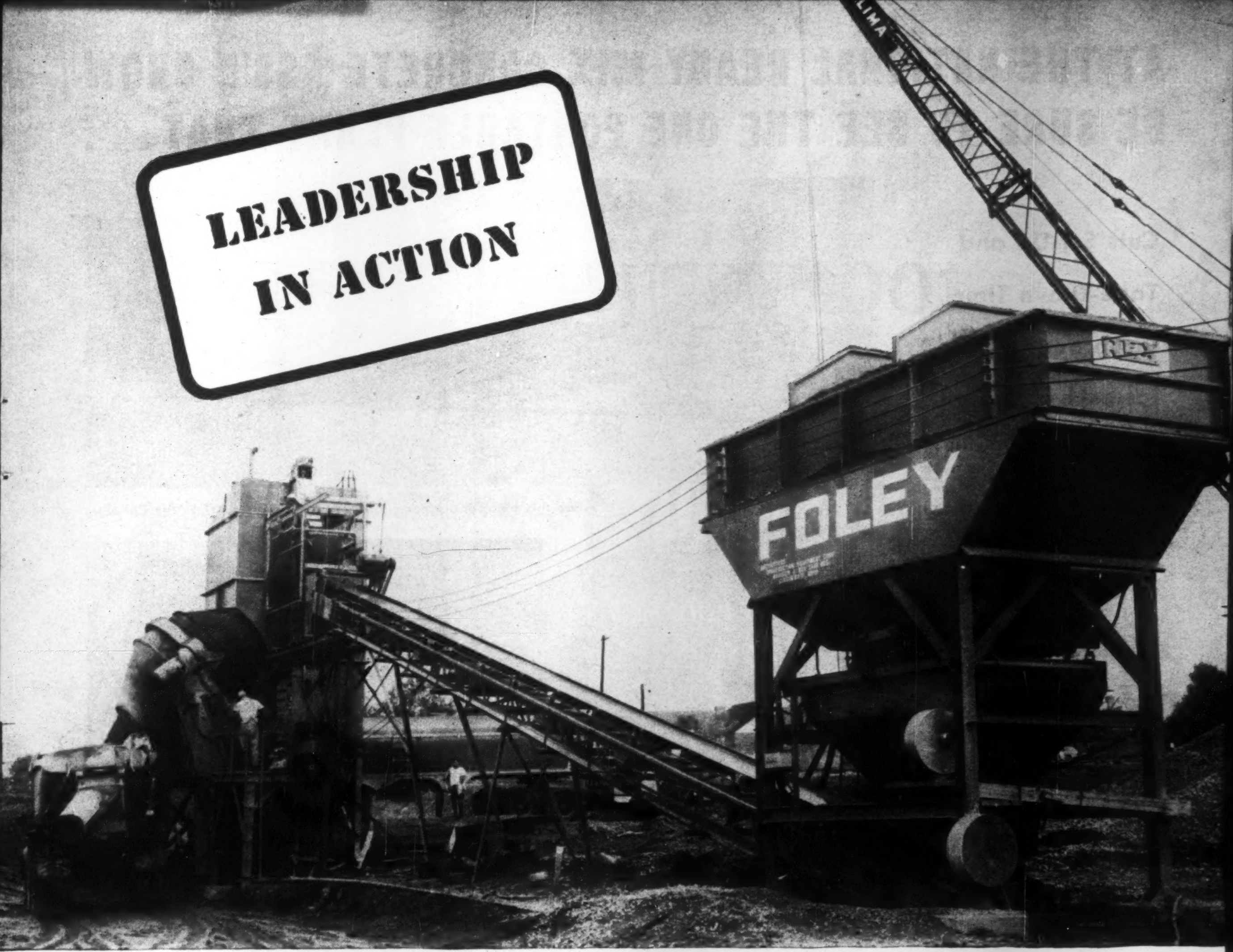
The widely extravagant claims are completely ridiculous and should not be dignified with a reply. These statements completely destroy whatever merit any portion of the letter might have had.

I am embarrassed for my profession that a consultant could be so contemptuous of his clients and so foolish as to display this feeling. Surely any "delay" or "punishment" that he were to receive hereafter will have been richly deserved.

The past achievements of the state highway departments working with the assistance of consulting engineers have been impressive. However, to be successful it must, like all partnerships, be based upon mutual respect and cooperation. Engineering News-Record has done a great disservice to both our highway officials and to the consulting engineering profession by publicising this absurd attack upon our highway departments, which, if taken seriously, could only foster dissension.

Donald A. Ostrower
Arnold H. Vollmer Associates
Consulting Engineers
New York, N. Y.

(Reader Comment continued p. 22)



REX LEADS THE WAY–

IN CENTRAL-MIX ROAD PAVING

New idea in concrete road paving: *central*-mix your concrete.

Spot a Rex Portable Central-Mix Paving Plant along the right-of-way—haul quality-mixed concrete to the paving train. Costs go down; production goes up. Rex Plants have highest production with capacities to meet *any* paving requirement.

Rex hastened the day of central-mix paving with practical *portability* of the complete plant—batchers, mixers, conveyors.

Rex Plants are moved in easily. They're set up and operating in a few days. To move up as the job progresses is just as easy—just pick up and go!

What's more, with Rex-O-Matic Automation, the entire batching and mixing job is reduced to pushing buttons—for just *one* man!

For complete information on this important development, see your Rex Distributor. Or write us.

THE COMPLETE REX LINE

Concrete Paving
- 34-E Pavers
- Central Mix Plants
- Batching Plants
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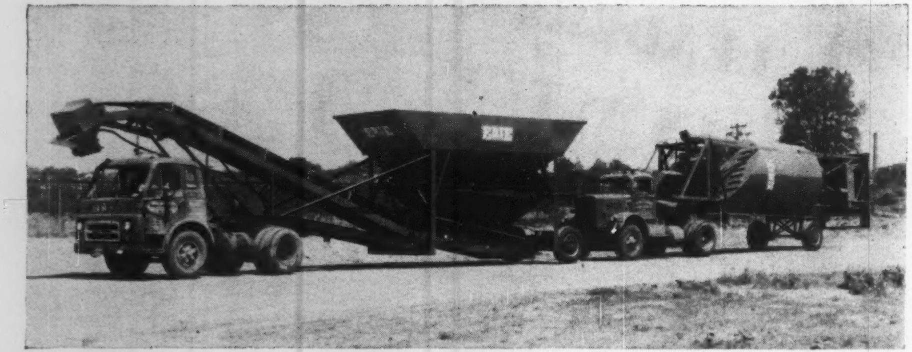
AT THE NATIONAL READY MIX CONCRETE ASS'N SHOW BE SURE TO SEE THE ONE PORTABLE PLANT THAT...

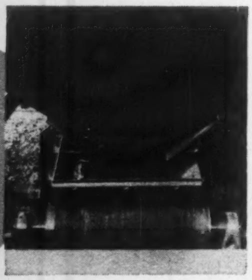
Cuts Set-Up and Take-Down Time to an hour or less★ for each operation



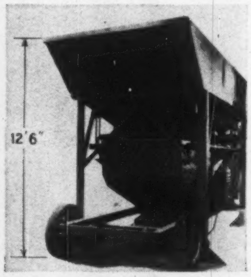
★ ACTUAL FIELD EXPERIENCE

See this plant and other equipment at Space No. 37 in the Coliseum

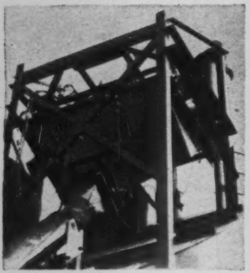
These 8 FULLY DEVELOPED OPERATION FEATURES MAKE ERIE'S TPA-TPC OUTSTANDING IN ITS FIELD



CLAMSHELL DISCHARGE GATE. Close-up shows compact design that needs no extra headroom. Over-all height remains the same 12'-6".



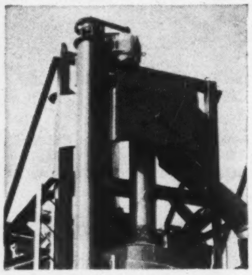
SAME LOW PLANT HEIGHT. Erie's low operating and travelling height of 12'-6" is handy. Plant can be charged with front end loader.



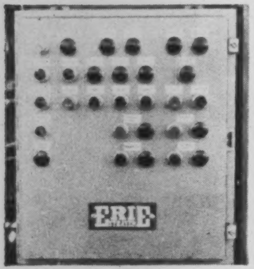
CEMENT BATCHER FACTORY ASSEMBLED. One reason for Erie's fast set-up and take-down time is the cement batcher. It's in permanent operating position.

BELT CONVEYOR ALSO FACTORY INSTALLED. Another great time saver. The conveyor is factory assembled. It does not need set up or take down.

SEPARATE DRIVE FOR HORIZONTAL SCREW. We build our own cement charging system to our own field-tested specifications. You're sure of long trouble-free service.



VERTICAL SCREW HAS SEPARATE DRIVE. Erie's separate drives are rugged. Special seals and bearings protect them from harmful abrasive dust.



ONE-PANEL CONTROL. On Erie's Automatic Plant, the batchers for both cement and aggregate are operated from the aggregate plant. Another time saver.

AUXILIARY SILO EASILY ADDED. Just remove the end plate from horizontal screw on TPC and attach auxiliary recirculating screw. No additional power is needed.

**If You
Can't Make
The Show
You Can
Still Get
The Facts
Write Today
Dept. R-10**

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BUCKETS & BINS
THE WORLD OVER

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to finish ahead of more expensive equipment

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TRACTOR SHOVEL

Speaks for Itself:

"HAVE DONE... CAN DO!"

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INSTANT REVERSE

Go Forward or Back at a Touch of your Toe!

NO SHIFTING...

NO CLUTCHING...

NO LEVERS TO PULL!

Fast in-and-out maneuverability, with exclusive "Instant Reverse," give the Massey-Ferguson 1001 power, speed, and agility to outperform larger, more expensive single-purpose machines! Direct thrust from low pivot points . . . 9300 lbs. pryout power . . . 43° rollback at ground level . . . and telescoping loader arms, make the rugged 1001 the *outstanding tractor shovel* buy in the 1-cu.-yd. class. A complete line of power-matched attachments for sweeping, dozing, lifting, ditching, or scarifying give low-cost versatility. It does it for others; it can do it for you. Let your M-F Industrial Dealer arrange an on-the-job demonstration today!

Why Wait? — Set a Date — We'll Demonstrate!

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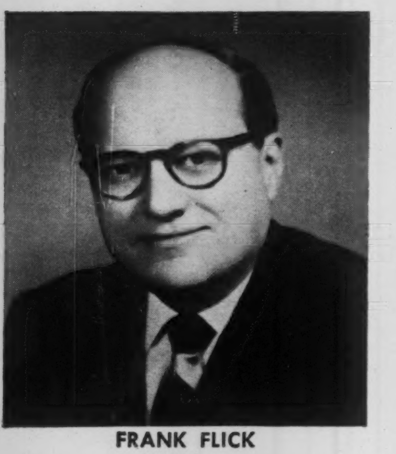
MF 60-3

FLICK-REEDY CONCRETE FLOOR

3 WAY PROTECTION



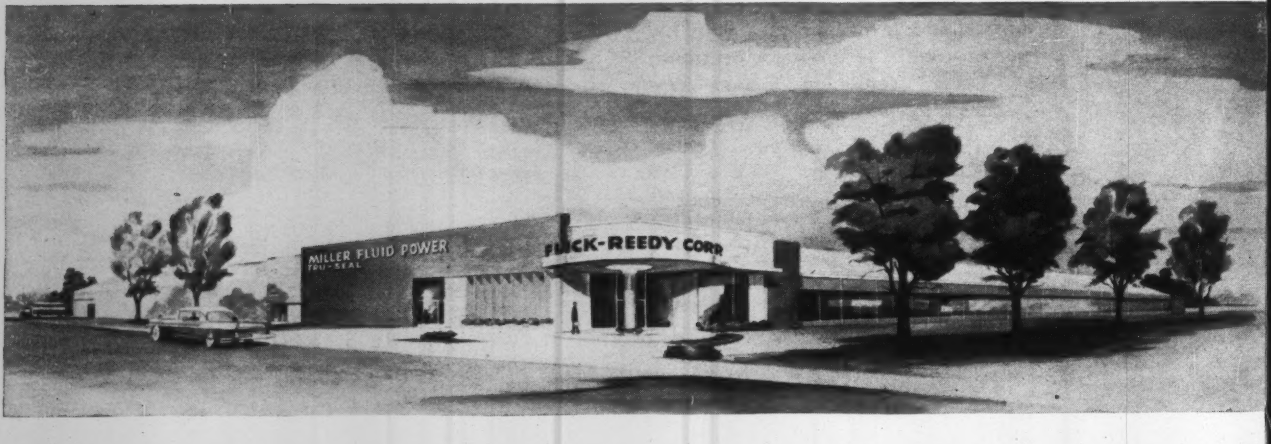
FRANK FLICK
President
Flick-Reedy Corporation
with its Miller Fluid Power Division,
Bensenville, Illinois
Producers of industrial hydraulic
and air cylinders.

"We are pleased to acknowledge West Chemical Products Inc. for its contribution to the development of our new plant facilities at Bensenville, Illinois.

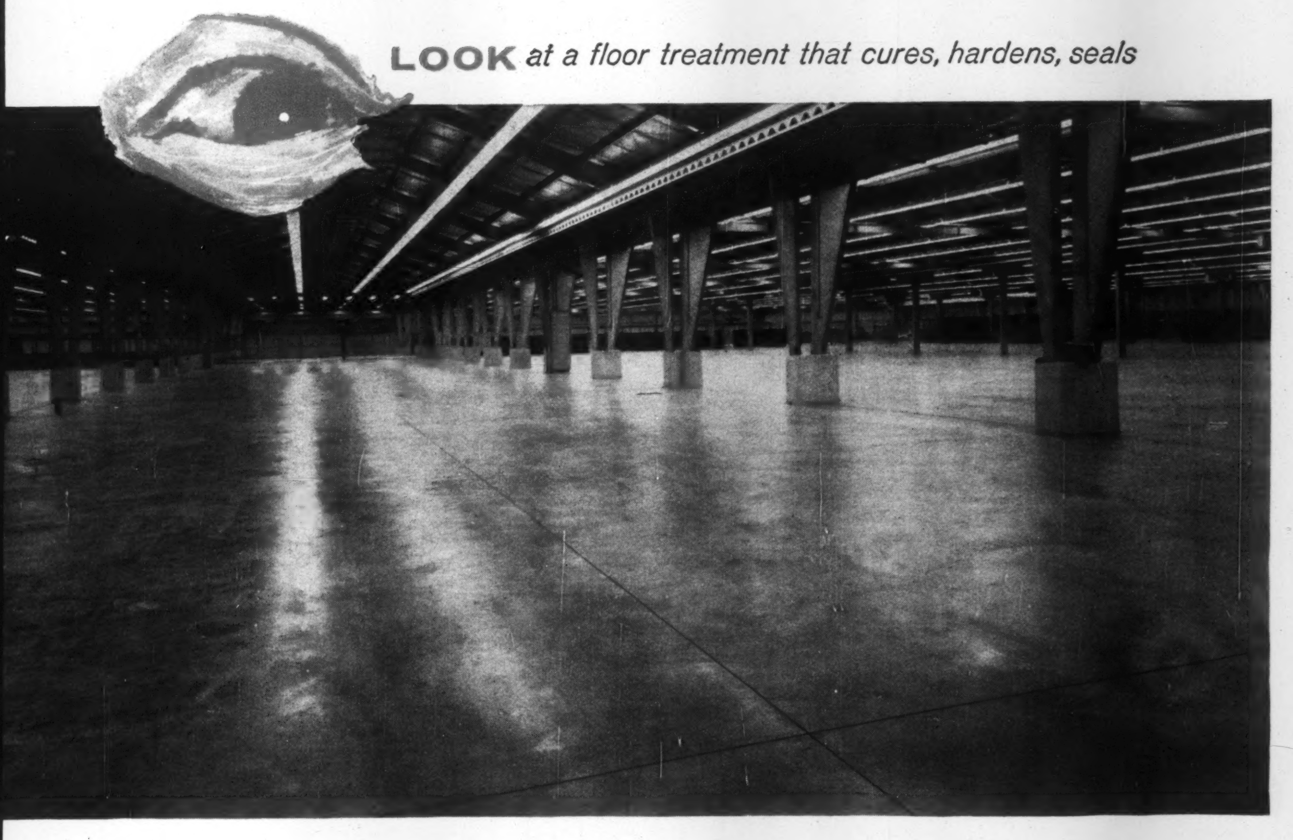
"In keeping with our purpose to attain outstanding facilities in advanced industrial design and function, the selection of materials and equipment was an exacting process. Your product, West Concrete Floor Treatment, was so selected by the designing architectural engineer and our own technical staff and specified for the dust-proofing and sealing of over 150,000 square feet of concrete flooring in the plant and warehouse areas.

"We are most happy with the results obtained. The attention given our project by your Chicago sales and technical staff certainly merits the designation of 'Products with Service' for your company."

ZAY SMITH & ASSOCIATES • AIA • ARCHITECTS-ENGINEERS • LA GRANGE, ILLINOIS



WITH 1 APPLICATION



LOOK *at a floor treatment that cures, hardens, seals*

The new Flick-Reedy Plant is ultra modern—from its use of rain for water supply right down to its concrete floor. This 150,000 sq. ft. area was protected with a modern, simplified treatment. Cured, hardened and sealed with a single application of WEST CONCRETE FLOOR TREATMENT.

WEST CONCRETE FLOOR TREATMENT saves labor, materials and time. It can be applied as soon as concrete is set enough to walk on. Avoids delays after pouring. Replaces as many as three separate products and applications. Eliminates labor required for cleaning after delayed drying between the use of separate products.

WEST CONCRETE FLOOR TREATMENT is a quick drying formulation. Even spreading. Easily applied by unskilled labor. It enables newly-laid wet concrete to retain 95% of its moisture. This permits curing and hardening while sealing and dust-proofing the surface. Meets ASTM Specification C-309.

WEST CONCRETE FLOOR TREATMENT has been used successfully, for many years, in major private and public construction projects throughout the country.

For a sample and full details, contact any West office in principal cities. Or send the coupon below to our Long Island City headquarters. Dept. 23

Please send a sample and full details on WEST CONCRETE FLOOR TREATMENT.

Name________________________________

Position______________________________

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REDUCE SHORING COSTS 50%
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WACO HI-LOAD SHORING EQUIPMENT
WACO MANUFACTURING CO
SEND TODAY FOR COMPLETE STORY

HI-LOAD is specifically engineered for Heavy-Duty shoring. Load capacity of 10,000 lbs. per leg is *TWICE* the capacity of conventional steel scaffolding. In addition to saving on initial equipment, *HI-LOAD* with *Speedlock*, reduces erection and stripping time, forming, handling costs and storage. Complete line of accessories available . . .

A Complete Line of Shoring Equipment to any required height

POST SHORES Wide Range, 6' to 15'6". Patented Speedset adjustment. Head styles to meet all requirements.

SECTIONAL SCAFFOLDING Patented *Speedlock*, built-in ladders, pivoted cross braces, wide variety of frames and complete accessory line.

WACO Manufacturing Company

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Licensees: Armson Iron Works, Windsor, Ontario
Tubular Structures Corp. of America, Los Angeles, California

. . . Reader Comment

▶ Is Mr. Walsh so naive as to suggest that every highway commissioner in the country is trying to be a good fellow to his employees regardless of its cost to the taxpayer?

At a recent Minnesota Legislative Highway Interim Commission meeting, a witness testified that most consulting firms hired ex-highway employees at $50 to $150 per month more than the state had paid them. How then can they do a job for less?

Mr. Walsh goes on to poke fun at a New Jersey group's alarm at the rising use of consultants. He states "If we all work for the government, who is left to pay the taxes to support it?" Does Mr. Walsh presume to think that consultant's employees will not be paid from tax money? We would be willing to bet that, percentage wise, fewer state employees evade their taxes than any other comparable group.

Mr. Walsh then goes on to poke fun at the government "so-called career employees." Maybe Mr. Walsh feels he will never grow old. As for perpetual coffee breaks, we wonder who makes stubs of all the state's pencils? Undoubtedly Mr. Walsh is not very well informed. One has only to check the Civil Service Department, or some one from the Minnesota Self-Survey Committee, to learn that State employees are at least on a par, productive-wise, with private industry. They will also find that salary and fringe benefits are not comparable to those of private industry. It is certainly hoped that the general public is not as ignorant as Mr. Walsh. It is odd that he complains of unfounded charges when two-thirds of his letter is the same thing.

ROBERT MEYER
Minnesota Maintenance, Administrative and Professional Employeees Local No. 1011
St. Paul, Minn.

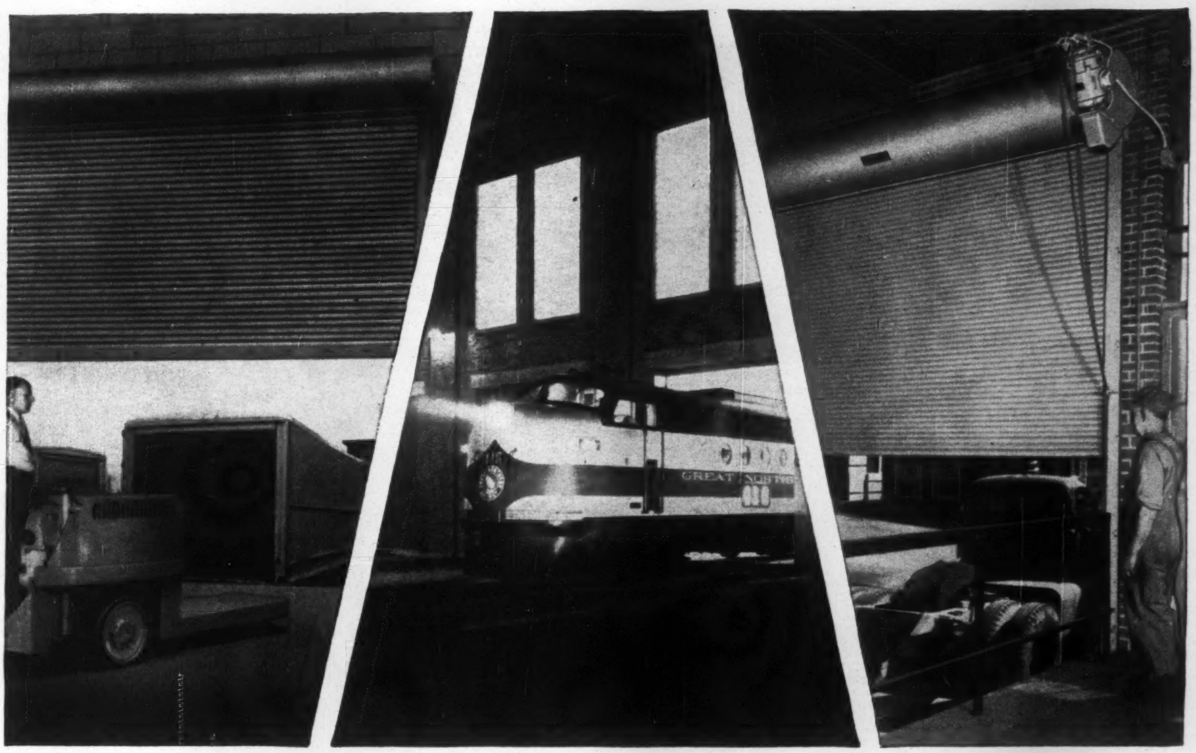
▶ Having worked as an engineer for a state agency, a consulting firm, and a construction firm, I would agree with some things and disagree with others.

The sum total of engineering work is not a fixed unit. Work done by government agencies does not mean less work for consultants. Engineering research and new projects broaden the desire and need for further engineering services.

We state engineers would be among the first to congratulate the consultants if they would join in an effort to streamline legislation as to the letting of contracts, release of funds, and faster payment of obligations, as long as the public welfare is amply safe guarded.

I can say from my exeprience that there is as great a percentage of dedicated hard working engineers in my particular state agency as there were when I was working for a consultant.

(*Reader Comment continued p.* 32)



Cut "In-And-Out" Handling Costs with KINNEAR Steel Rolling Doors

In your search for proved ways to cut costs and speed up operations, have you considered the gains you can make "door-wise"?

For example, Kinnear Doors *save time* by clearing the entire opening in a single, easy, upward action. Then they *stay out of the way,* coiled compactly overhead, until closed.

In addition, all floor and wall space around a Kinnear Rolling Door is *fully usable at all times.* You can stack "mountains" of materials close inside or outside the door curtain — ready for fast, through-the-door handling by the shortest route.

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Rugged all-metal construction plus heavy galvanizing* give Kinnear Rolling Doors extra ability to stand up longer under hard, daily use—through all kinds of weather. And you get more protection against fire, theft, intrusion and vandalism with Kinnear Rolling Doors.

Kinnear Doors are built to fit any new or old doorway. Electrical, manual or mechanical operation to meet *your* need. Write for full information.

*(with 1.25 oz. pure zinc per sq. ft. of metal, ASTM standard)

Kinnear RoL-TOP Doors
(Sectional-Type)
Are Also Available

Among the line of Kinnear Rolling Doors and Grilles described in this catalog you'll find details on the Kinnear RoL-TOP Doors — the door composed of rugged, heavily galvanized sections, hinged horizontally (available also with wood sections). For "Saving ways in Doorways", it will pay you to have this catalog on file.
Send for copy today.

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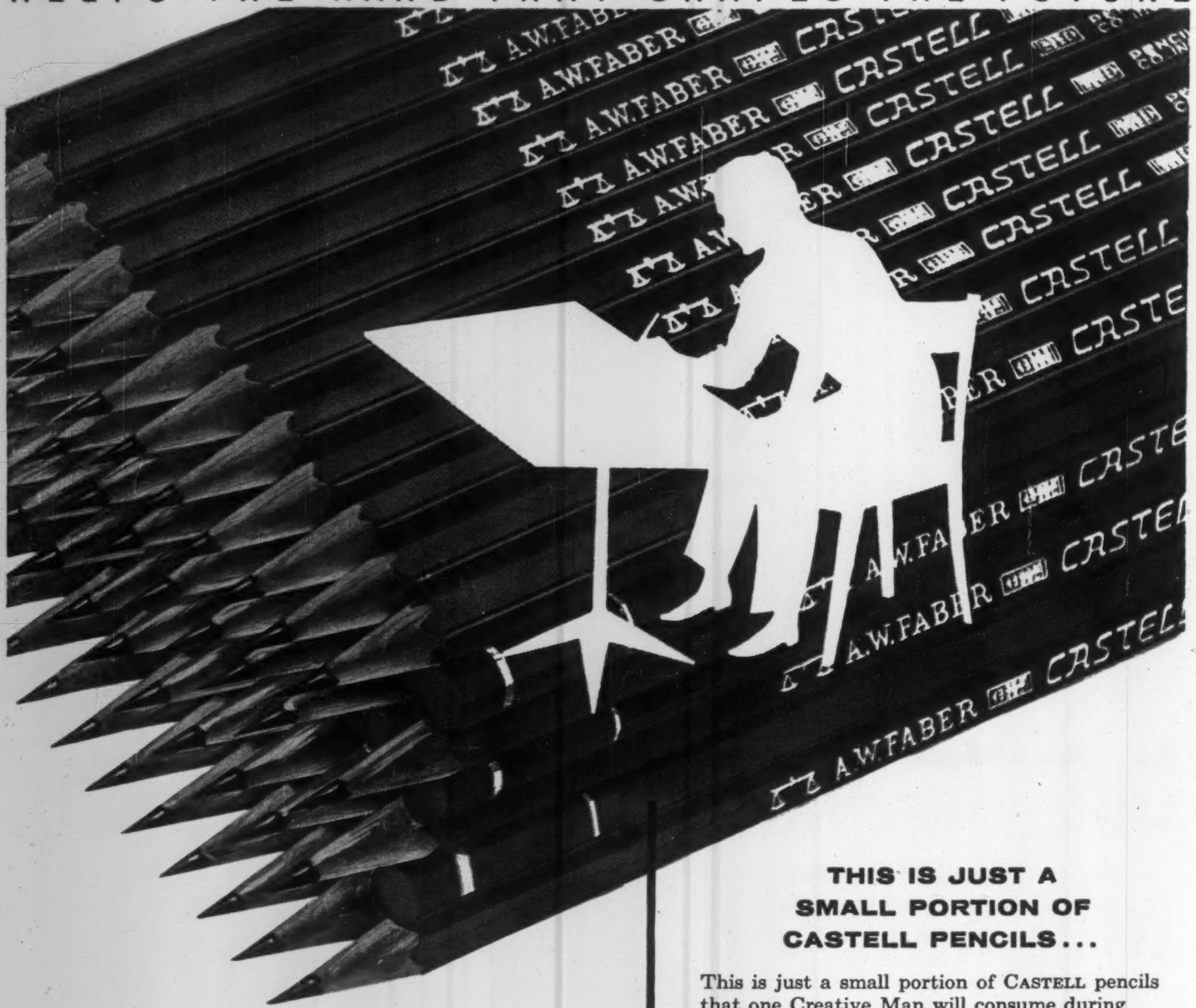
KINNEAR
ROLLING DOORS

HELPS THE HAND THAT SHAPES THE FUTURE



THIS IS JUST A SMALL PORTION OF CASTELL PENCILS . . .

This is just a small portion of CASTELL pencils that one Creative Man will consume during his career. To be specific, a typical engineer, architect, designer or draftsman will consume a minimum of 3,096 CASTELLS. From the combined excellence of the Creative Man and the world's finest drawing pencil will evolve an exciting new tomorrow for mankind.

It is not known how many holders and leads a man will use. But it is certain that top creative men will insist on the quality of CASTELL LOCKTITE SG TEL-A-GRADE 9800 and imported CASTELL 9030 Refill Leads.

Backed by nearly 200 years of uninterrupted manufacturing experience—since 1761.

A.W.FABER-CASTELL
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#9000 CASTELL Pencil with world's finest natural graphite that tests out at more than 99% pure carbon. Exclusive microlette mills process this superb graphite into a drawing lead that lays down graphite-saturated non-feathering lines of intense opacity for cleaner, more durable originals and clearer, sharper prints. Extra strong lead takes needlepoint sharpness without breaking or splintering. Smooth, 100% grit-free consistently uniform pencil after pencil, in full range, 8B to 10H.

#9007 CASTELL Pencil with Eraser.

#9800SG CASTELL LOCKTITE TEL-A-GRADE Holder, perfectly balanced, lightweight, with new no-slip functional grip that lightens finger pressure without slipping, and *relieves finger fatigue.* Unique degree lead indicating device.

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CASTELL Pencils and Leads draw perfectly on all surfaces, including Mylar-based Polyester drafting films. Give graphite-saturated lines, easy to erase — excellent reproduction.

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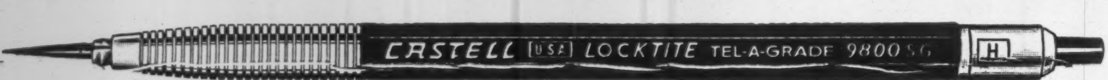
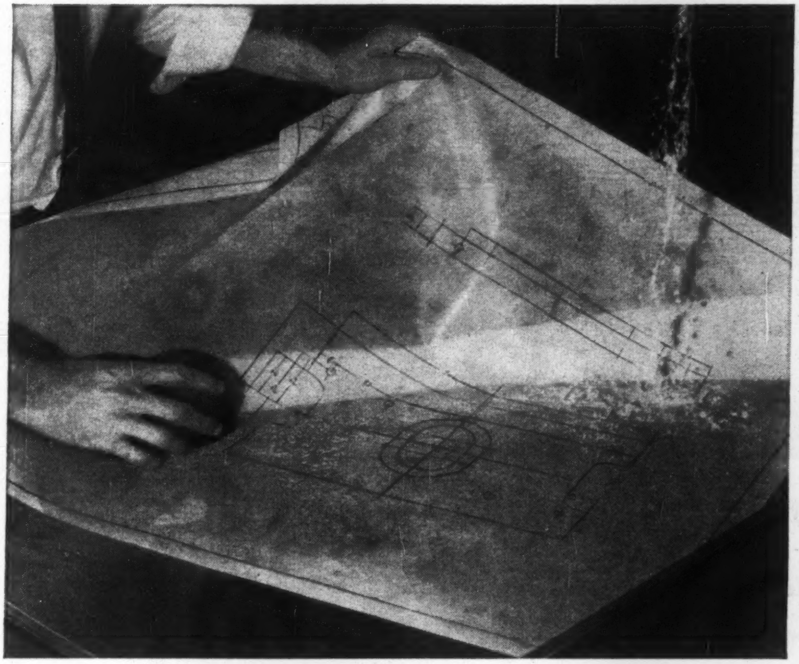


Some Ideas

K+E

for your file of practical information on drafting and reproduction from
KEUFFEL & ESSER CO.



This badly-soiled drawing is getting a mild soap-and-water bath to restore its original printing quality.

Tracings you can wash! Mention this to a Chief Draftsman and you'd likely see his eyes light up as he perceives the implications of a simple new technique – one that's being used now by Raytheon Co. and could save them at least $50,000 this year. The secret: Herculene® Drafting Film by K&E, plus Staedtler Duralar plastic pencils —a completely washable combination, and the answer to . . .

A Dirty Old Problem

Functionally, an engineering drawing is only as good as the prints it will produce. This is a fact of life that governs any distribution-print system—conventional blueprints, white prints, or reduced-size prints. It holds true in a full-fledged miniaturization program, too. How long will an original tracing continue to produce top-notch prints? The answer depends on how much and what kind of handling it receives. Revisions, smudging, processing and filing all take their toll of a drawing's printability, decreasing it gradually – and sometimes quite sharply. As printing quality diminishes, some form of rehabilitation becomes necessary. But re-drawing – whether manual or photographic – can be costly and time-consuming. Drafting and reproduction experts have been wishing and working for a more efficient and economical solution.

A Simple Solution: Soap-and-Water

Washing became a possible answer with the advent of polyester-base drafting films and plastic pencils – and a practical reality with Herculene. This remarkable film combines a stable, waterproof Mylar® base with a completely washable surface for smudge-proof Duralar pencil lines—which *bond* to the Herculene surface and won't wash off.

Only the dirt washes away. There's no loss of line-background contrast, no loss of detail. The tracing can be restored to its original condition in a few moments – without re-drawing!

A Proved Money-Saver

To amplify an earlier point: the Missile Systems Division of Raytheon has been washing Herculene drawings for the past year, and now expects to save over $50,000 on re-draws alone in the year ahead. A large aircraft manufacturer has used the Herculene-Duralar soap-and-water method even longer, and reports impressive dollar savings plus an outstanding improvement in print quality.

In 6 months of testing and 14 months of actual drafting-room use, Raytheon engineers exposed Herculene to all basic trials – and a battery of fiendishly extreme conditions. They scored Herculene with a sharp scriber, but couldn't remove the matte surface. They taped a sheet to the floor and had a 200 pounder roll over it in a swivel chair during an active day. Herculene was baked and frozen – and doused with hot coffee – with no effect on its surface. After two hours, the coffee stain was washed off without a trace. Results of these torturous tests were so favorable that now, Raytheon's Missile Systems Division uses practically no drafting film *but* Herculene!

A Note of Caution

There are other waterproof drafting films, but plastic pencil lines will wash off some of them. So, when comparing polyester-base films, it's best to check them for *pencil line washability*. And another point—don't try this technique with ink or graphite lines – use only the Duralar K1 or K2. Even if you don't want to adopt the washing technique immediately, you're free to make the change at any time if you use Herculene—the *indestructible* drafting medium with the washable, engineered surface.

More Merciless Testing Invited

We'd be pleased to send you a sample of Herculene, and we invite you to do your best to ruin its excellent drafting and printing quality. The Herculene sheet comes in a small folder with complete instructions and a water-fast Duralar pencil – which K&E engineers helped develop for use with washable Herculene Drafting Film. Mail the coupon below for your sample!

KEUFFEL & ESSER CO., **Dept. ENR-1, Hoboken, N. J.**

Please send me further information about the washable tracing method, plus a sample sheet of Herculene Drafting Film and a Duralar pencil.

Name & Title______________________________

Company & Address______________________________

____1809

GUESS WHAT'S GOING UP HERE!

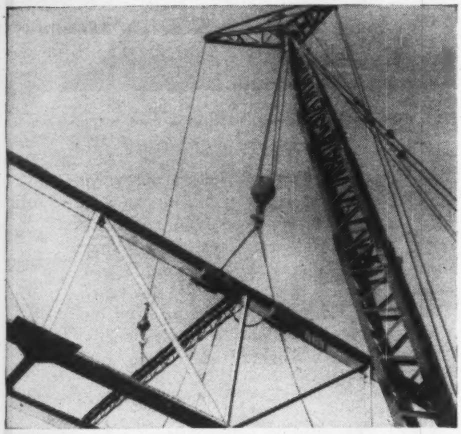
☐ **Office Building** ☐ **Warehouse** ☐ **School**
☐ **Factory** ☐ **Store** ☐ **Hospital**

Happens to be a school building, but any other guess would be no reflection on your good judgment.

For Sheffield Open Web Steel Joists speed construction and cut costs in *every* type of building. Versatility is their middle name. They come in longspan and shortspan sizes. Their structural and design possibilities are as high, wide and handsome as the imaginations of architects, engineers and contractors.

Sheffield Steel Joists combine strength and light weight for any type of floor, roof and ceiling. They're quickly installed and furnish support for a working platform right away. The underslung, open web design allows fast placement of pipes, conduits and ducts. Other trades can begin work promptly. The need for slow, expensive falsework is eliminated entirely. And the light weight of Sheffield joists makes possible lighter construction of columns, walls and foundations with full strength rating.

Learn more about how these advantages can be turned to your benefit. Get in touch with your nearest Sheffield office.



Going up . . . faster: Sheffield joists are easily handled, quickly installed. They're quickly available, too — thanks to Sheffield's strategic locations.

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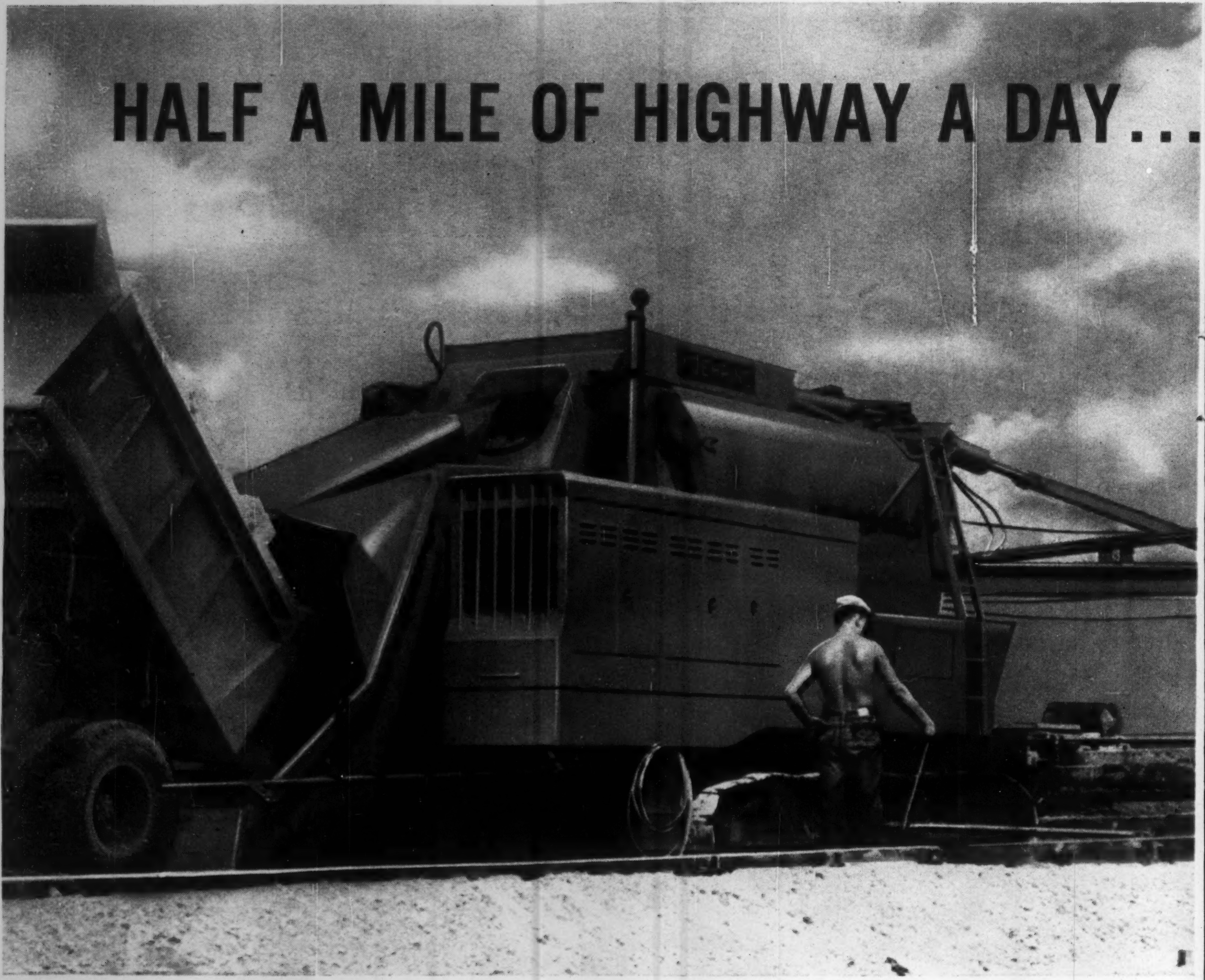
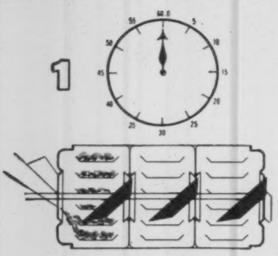
HALF A MILE OF HIGHWAY A DAY...



3-COMPARTMENT DRUM PRODUCES APPROX. 2 BATCHES OF CONCRETE (74.8 CU. FT.) EVERY MINUTE

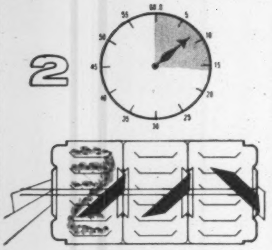
Note: Shaded area of clock shows interval of time required for each portion of mixing cycle illustrated. Arrow shows half-way point of elapsed time in each step. Position of transfer chutes, discharge chute, material, etc., is shown for that particular *instant* in the mixing cycle.

1



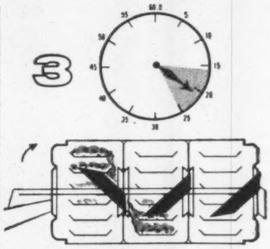
Skip raised, automatically by Batchmeter (after release of safety device by man directing batch trucks into skip) . . . water starts into drum automatically . . . dry material flows into #1 compartment . . . Batchmeter set . . . mixing cycle begins at 0 seconds.

2



First batch mixing in #1 compartment . . . skip down, batch truck depositing material in skip . . . water-measuring tank being filled from supply tank.

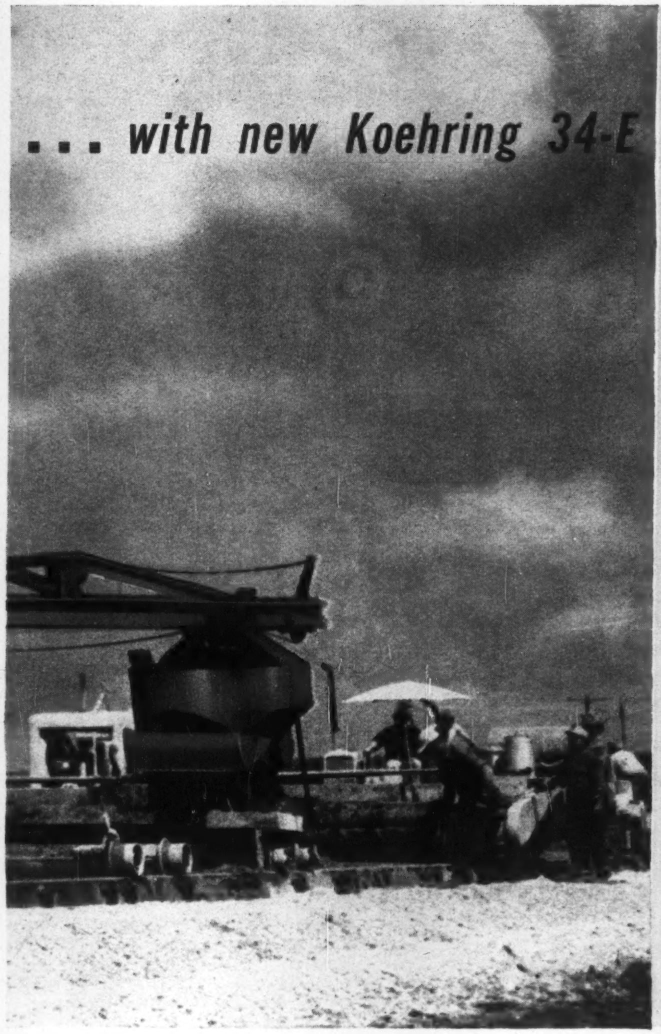
3



First batch being mixed and transferred from #1 compartment to #2 compartment . . . skip starts up automatically (after safety release) with dry material for 2nd batch . . . water-flow for 2nd batch starts automatically as skip raises.

KOEHRING HEAVY DUTY

It pays to KEEP YOUR EYE ON KOEHRING!



. . . with new Koehring 34-E TRIBATCH

To profitably bid and take paving contracts for 1960, be ready to compete production-wise, cost-wise with this new "break-through" in paver output: 2,580 lineal feet of 24-foot-wide, 9-inch-thick concrete pavement can now be laid in a 10-hour day with *one* 34-E paver — the new Koehring® three-compartment TRIBATCH!

43% MORE OUTPUT

with no change in your present batch plant, trucks, finishers

Size-wise, the 34-E TRIBATCH fits right in with your present paving spread — no need to modify or change existing batching, hauling, spreading, finishing equipment. (Only exception would be additional batch trucks, depending on length of haul.) Secret of high TRIBATCH output is in the continuous "assembly-line" production of its 3-compartment mixing drum. Here's the difference:

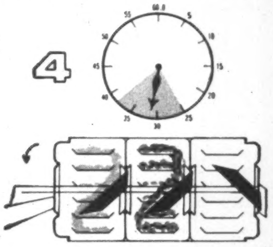
60-SECOND MIXING TIME

	34-E TRIBATCH	34-E dual-drum
Cycle time:	29 sec.	41.5 sec.
Batches per hour:	124	86.7
Yards per hour:	172	120

Consider what this 43% production increase can mean in your 1960 profit margin. Better be ready to *go* with a 34-E TRIBATCH. Call your Koehring distributor, or write today.

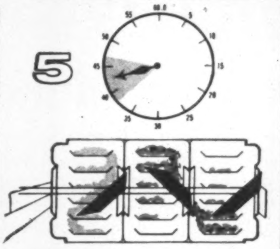
KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

4



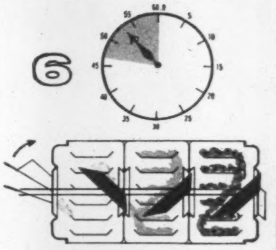
First batch being mixed in #2 compartment . . . 2nd batch being mixed in #1 compartment . . . skip is being lowered to receive additional material . . . water measuring tank is being filled from supply tank.

5



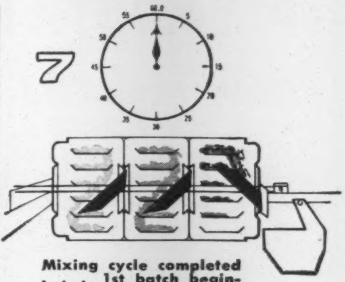
First batch being mixed and transferred from #2 compartment to #3 compartment . . . 2nd batch being mixed in #1 compartment . . . skip down, batch truck dumping material in skip . . . water-measuring tank being filled from supply tank.

6



First batch being mixed in #3 compartment . . . 2nd batch has just finished transfer to #2 compartment and will continue to be mixed there . . . skip coming up for introduction of 3rd batch into #1 compartment . . . water-flow has just begun for 3rd batch.

7



Mixing cycle completed . . . 1st batch beginning discharge from drum into bucket . . . 2nd batch mixing in #2 compartment . . . 3rd batch mixing in #1 compartment . . . skip down ready to receive dry material for next batch . . . *clock reads 60 seconds!*

To: Koehring Division
3026 W. Concordia, Milwaukee 16, Wis.
Send: ☐ bulletin ☐ spec. sheet on 34-E TRIBATCH

NAME__________ TITLE__________
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ENR
127

PLYMOUTH Mine-O-Motives help set new records at West Delaware Tunnel

A fleet of 17 Plymouth Mine-O-Motives, employed by joint venture contractors Drake-Grafe-Winston-Tecon-Conduit under Project Manager Clancey O'Dell, have helped to establish new hard-rock tunneling records of as high as 85 feet per day on the West Delaware Tunnel near Cannonsville, New York. Working around the clock since the summer of 1956, these Diesel-powered mine locomotives have seen the most rugged service imaginable for mechanical equipment. Rough trackage, deep water, heavy loads of rock waste, all on a 24 hour schedule to push this 45 mile long tunnel deep through the Catskills for additional water to the New York City water system.

Used from the west portal and from several shafts on the western end of the tunnel, these 10 and 15 ton Diesel locomotives have proven their ruggedness and suitability for tunneling work. Plymouth exhaust conditioning equipment has maintained tunnel air at a high degree of purity. Easy accessibility of all parts speeds maintenance, keeps down time to a minimum. Torque-converter drive cushions shock loads, speeds up production, provides maximum power, and reduces operator fatigue.

For full information on Plymouth Mine-O-Motives and Locomotives, tailored to your exact haulage needs, contact The Plymouth Locomotive Works, Division of The Fate-Root-Heath Company, Dept. A-4, Plymouth, Ohio.

RAIL POWER

PLYMOUTH® MINE-O-MOTIVES

WITH TORQOMOTIVE (Hydraulic Torque Converter) DRIVE

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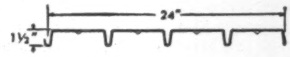
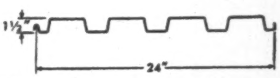
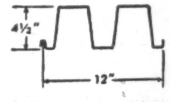
When it comes to roof systems, INLAND covers everything!



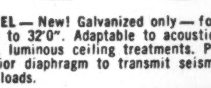
A-DECK — For purlin spacings not exceeding 8′4″. Narrow ribs provide deck surface that supports the thinnest or softest type of insulation.



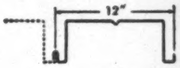
B-DECK — For spans to 10′0″. Wide rib distributes metal for greater structural efficiency — gives higher section properties per pound of steel — well suited for use as side wall panels.



C-DECK—Carries normal roof loads over spans up to 24′0″. Used extensively in canopies.



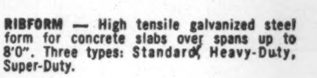
T-STEEL — New! Galvanized only — for clear spans to 32′0″. Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to transmit seismic and wind loads.



H-DECK — New! For simple spans from 10′0″ to 20′0″ — 3 and 4½″ depths. Especially practical to cover walkways in shopping centers, schools, other installations.

B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70 — used for spans to 10′0″.

C-ACOUSTIDECK — Offers same Noise-Reduction Coefficient as B-Acoustideck. Can be used for spans to 24′0″.



RIBFORM — High tensile galvanized steel form for concrete slabs over spans up to 8′0″. Three types: Standard, Heavy-Duty, Super-Duty.

◆ Whether your design calls for a dry insulation board roof or for wet-fill, there's an Inland roof system for the job — by the makers of famous Milcor steel building products.

Inland steel deck weighs less than half as much as poured-in-place or pre-cast construction. You can space joists wider and use lighter framework, to save both time and money. Panels are easy to handle and weld in place — in any weather that a man can work.

Types A, B, C, and H decks have the additional advantage of a Bonderized, baked-enamel prime finish that resists on-the-job damage. One field coat of paint on these Inland decks usually covers.

Write for catalogs 240, 241, and 245 — or see Sweet's sections 2c/Inl, 11a/In, and 2a/In.

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ENGINEERED PRODUCTS DIVISION

INLAND STEEL PRODUCTS COMPANY

Dept. A, 4147 West Burnham Street
Milwaukee 1, Wisconsin

EP-1A

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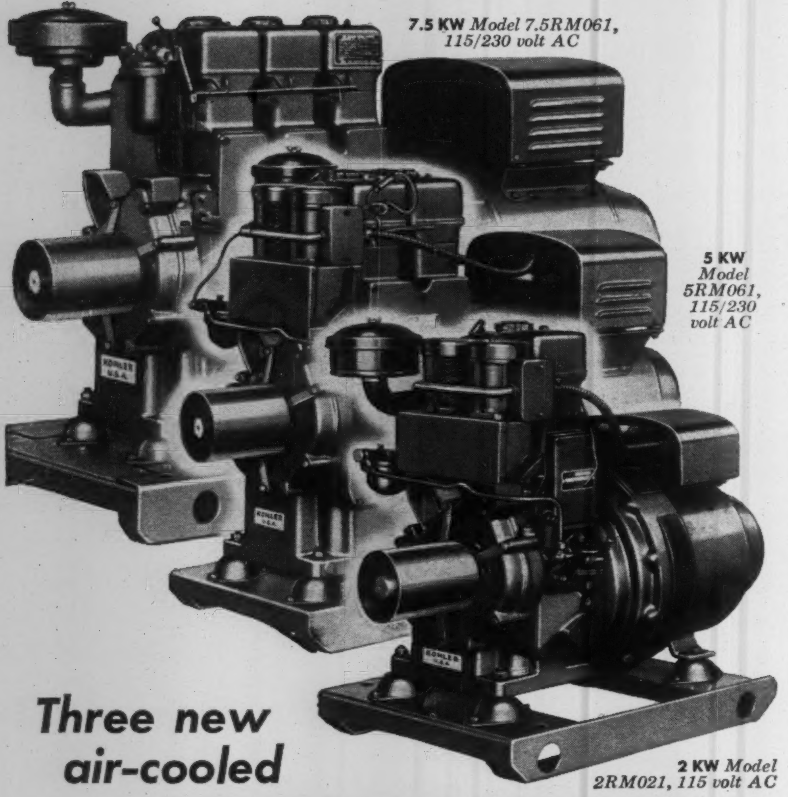
7.5 KW Model 7.5RM061, 115/230 volt AC
5 KW Model 5RM061, 115/230 volt AC
2 KW Model 2RM021, 115 volt AC
Three new air-cooled

KOHLER DIESEL ELECTRIC PLANTS

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Take advantage of the compact efficiency and economy offered by these new air-cooled Kohler diesels for your lighting, electric tool and other independent power needs. Easy, all-weather starting. Lightweight, each with skid-mounted base for easy handling. Low-cost diesel fuel operation. Available for remote, push-button or manual start.

Kohler electric plants have a world-wide reputation for rugged reliability under all conditions. Other sizes to 100 KW, gasoline and diesel. Write for folder G-22.

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KOHLER OF KOHLER

Enameled Iron and Vitreous China Plumbing Fixtures • Brass Fittings
Electric Plants • Air-cooled Engines • Precision Controls

Mr. Walsh evidently feels that his pay check might be threatened from state agencies, so perhaps his pay check is also important to him.

In many fields governmental agencies can do work more economically than outside consultants. We are proud of the fact that our organization often supplies data and engineering help to consulting firms and in many areas our engineers are tops in their field.

The old adage about preaching a better sermon and building a better mousetrap is still true. If Mr. Walsh can do a job cheaper and better Mr. Walsh is not likely to lack for work.

NED E. WILLIAMS
Division of Water
Department of Natural Resources
State of Ohio
Columbus, Ohio

► Come, come, Mr. Donald A. Walsh. An engineer is expected to be accurate and precise, especially a high-level consultant. Who ever heard of an "eight-hour coffee break"? Can you document that statement?

In my 24 years as a bureaucrat I have not taken a total of eight hours for coffee breaks, let alone eight hours each day. A most intemperate claim in your letter.

I venture to say that I have saved my employers, or the taxpayers, at least as much money as you have.

SAUL UHR
Washington, D. C.

Bridging the Project Gap

SIR—The article by Horace C. Crandall appearing in your November 12 issue brings into sharp focus the gap that exists on most engineering projects between design and specifications on the one hand, and construction on the other. The designer and specification writer more often than not look upon the construction supervisor as being too rough and careless in the way he executes what they have conceived. The construction man, on the other hand, looks upon the designer as too idealistic in his concept of construction conditions.

Result: Designs with high factors of safety, and increased construction costs, yet occasional failures do take place.

To bridge this gap, the writer developed for the Illinois Toll Highway an approach borrowed from industry. Construction is today so mechanized and involves so many repetitious operations that it is in effect an outdoor industrial activity. For that reason, industrial experience adapted to this highway project proved very successful. The writer outlined this approach in "Quality Control for Large Highway Projects," Proceedings of The American Society of Civil Engineers, separate No. 1626. It is applicable, with modifications, to all construction projects, small or large.

This approach consists in:

(*Reader Comment continued p. 35*)

1910
1911
1912
1913
1914
1915
1916

RIC-WIL 50th Anniversary

THE SUN NEVER SETS ON
OUR
50th
YEAR
1910-1960
RIC-WIL INSTALLATIONS

1954
1955
1956
1957
1958
1959
1960

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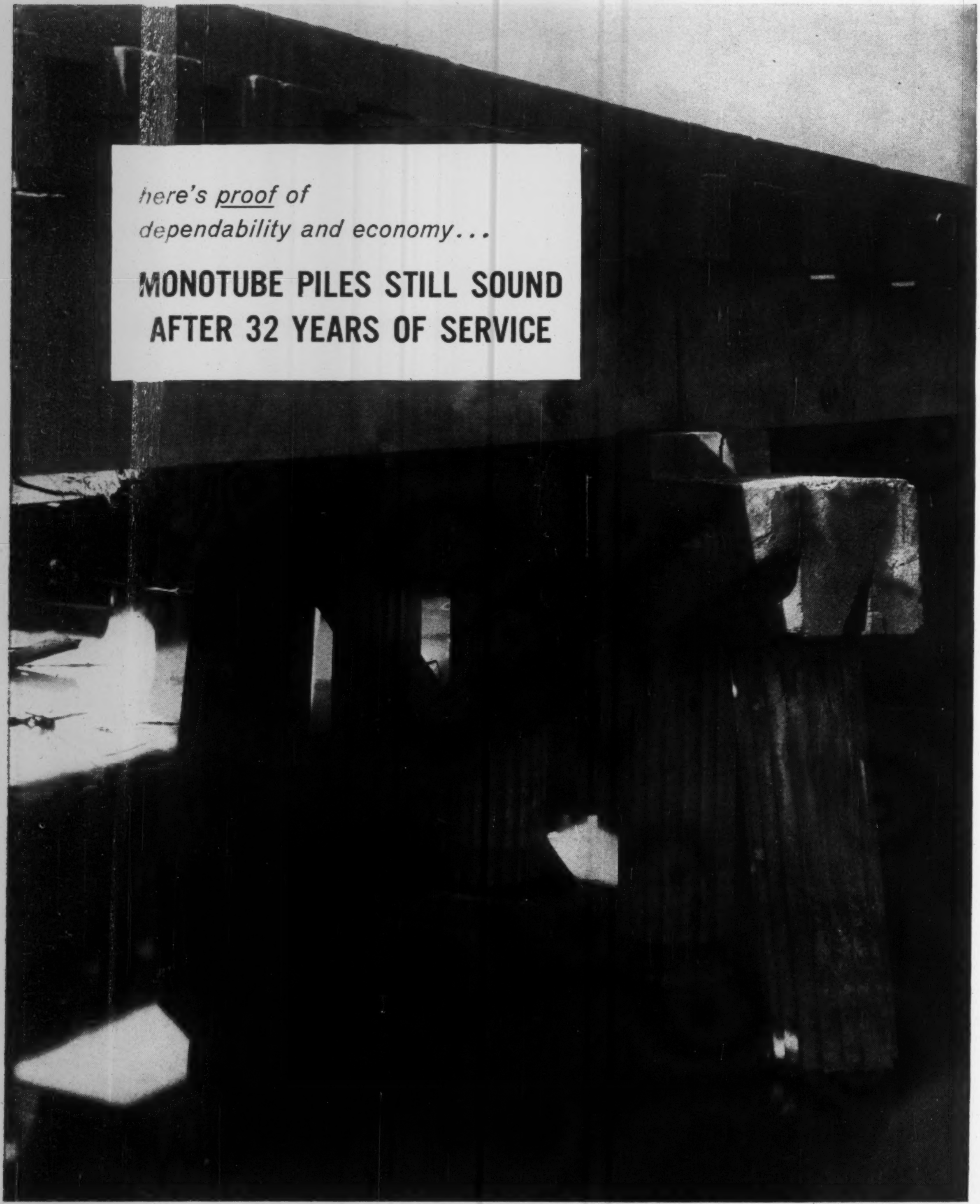


*here's **proof** of dependability and economy...*

MONOTUBE PILES STILL SOUND AFTER 32 YEARS OF SERVICE

In 1928 the first steel Monotube foundation piles were installed on one complete bent of a Wheeling and Lake Erie Railroad trestle bridge. A recent inspection proved the installation to be in excellent condition . . . ready for many more years of service.

Tapered, fluted Monotube steel piles are available in lengths, diameters and gauges to meet every requirement. The Union Metal Manufacturing Co., Canton 5, Ohio; Brampton, Ontario, Canada.

UNION METAL

Monotube Foundation Piles

. . . Reader Comment

1. Surveying field conditions to anticipate the construction problems that might develop.

2. Making sure that these problems receive cognizance in the designs and specifications, and that the latter contain provisions for quality control, the main feature of which should include contractor profit motivations (within the bid price) for furnishing better quality.

3. Indoctrinating inspection and field personnel and, where possible at the same time, the contractor supervisory personnel in methods to obtain the desired results with a minimum of fuss and with resultant increased production.

4. Following up during construction to handle problems that arise. Whether this is called Quality Control, Project or Job Control, or Construction Consulting (Mr. Crandall's term), it leads to the same end—more for the owner's dollar, and a better job that will last longer and will require less maintenance.

E. A. Abdun-Nur
Consulting Engineer
Denver, Colo.

For Your Calendar . . .

American Society of Heating, Refrigerating and Air Conditioning Engineers, annual meeting, Baker Hotel, Statler Hilton Hotel and Memorial Auditorium, Dallas, Tex., Feb. 1-4. Write: R. C. Cross, 234 Fifth Ave., New York 1, N. Y.

National Bituminous Concrete Association, annual convention, Sheraton-Cadillac Hotel, Detroit, Mich., Feb. 1-4.

American Society for Testing Materials, committee week meeting, Hotel Sherman, Chicago, Ill., Feb. 1-5. Write: ASTM, 1916 Race St., Philadelphia, Pa.

Society of the Plastics Industry, Reinforced Plastics Division Conference, Edgewater Beach Hotel, Chicago, Ill., Feb. 2-4. Write: Society of the Plastics Industry, Inc., 250 Park Ave., New York 17, N. Y.

American Institute of Mining, Metallurgical and Petroleum Engineers, annual meeting, Statler-McAlpine Hotel, New York, N. Y., Feb. 14-18. Write: Ernest Kirkendall, Secy., AIME, 29 W. 39th St., New York 18, N. Y.

Mason Contractors Association of America, annual convention, Netherland Hilton Hotel, Cincinnati, Feb. 21-24. Write: Mason Contractors Association, 208 S. La Salle St., Chicago 4, Ill.

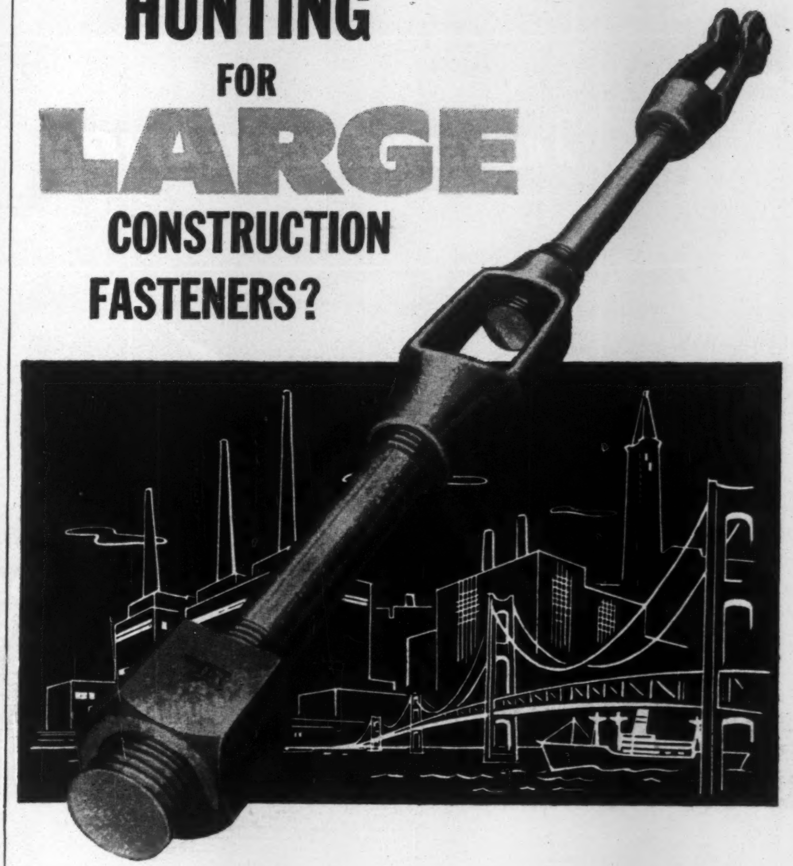
National Crushed Stone Association, annual meeting, Conrad-Hilton Hotel, Chicago, Ill., Feb. 22-24. Write: J. R. Boyd, Executive Director, NCSA, 1415 Elliot Place, N.W., Washington 7, D. C.

National Concrete Masonry Association, Statler-Hilton Hotel, Los Angeles, Calif., Feb. 22-24. Write: Kenneth Kavana, Public Relations, NCMA, 1015 Wisconsin Ave., N.W., Washington 7, D. C.

Malleable Founders Society, technical and operating conference, Cleveland, Ohio, Feb. 24-25. Write: Malleable Founders Society, 781 Union Commerce Building, Cleveland 14, Ohio.

Electrical Industries Show, New York City Coliseum, New York, N. Y., March 6-9. Write: National Electrical Industries Show, 550 Fifth Ave., New York 36, N. Y.

Steel Founders' Society of America, annual meeting, Drake Hotel, Chicago, Ill., March 7-8. Write: SFSA, 606 Terminal Tower, Cleveland 13, Ohio.



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Every engineer needs this free digest of large fasteners. Write for Bulletin 160, Joseph Dyson & Sons, Inc., 5155 St. Clair Ave., Cleveland 3, Ohio, Phone HE 1-6157.

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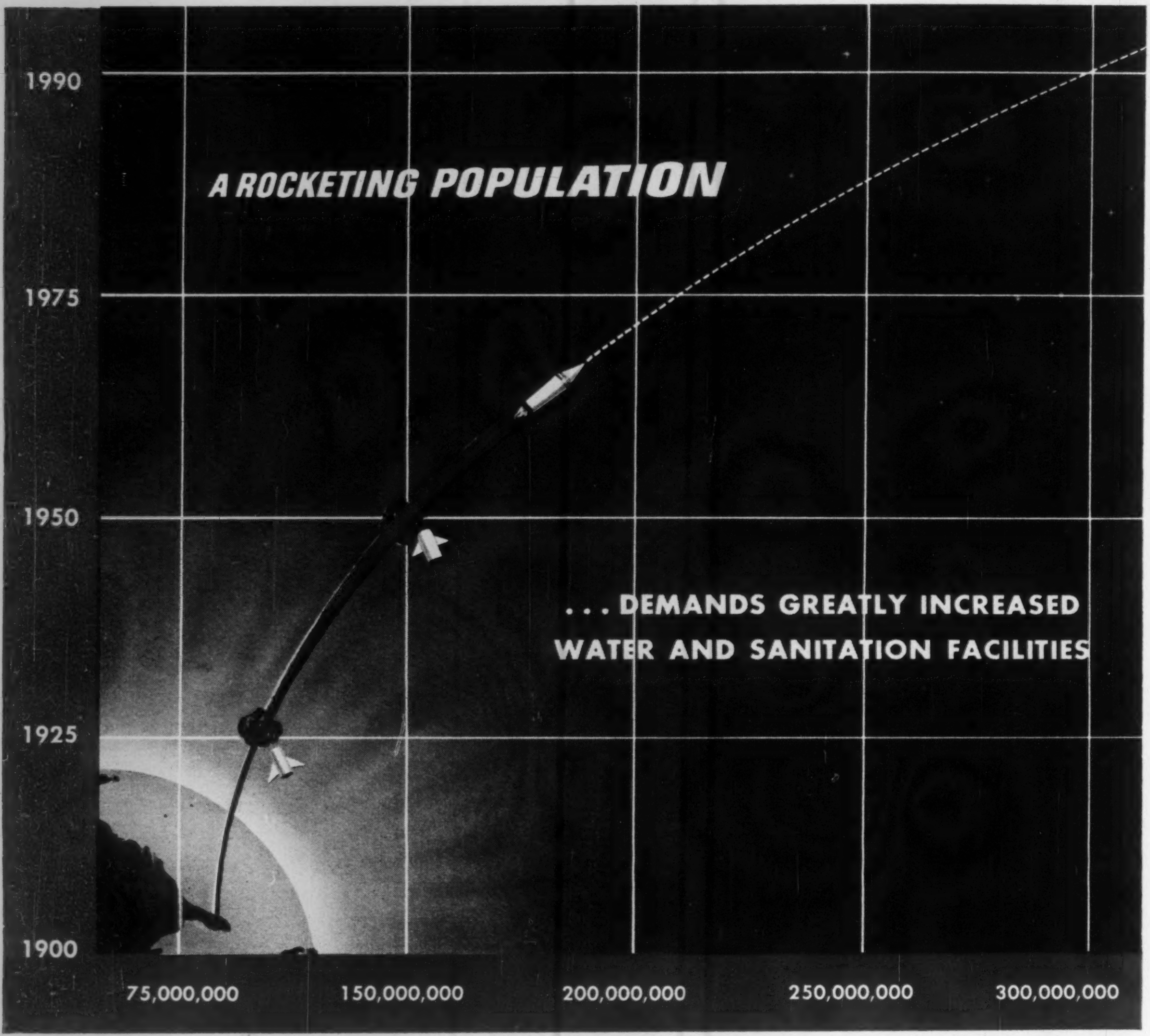

Growth of U.S. Population in Millions:

1900—75; 1950—150; 1990—300 (Estimated)

And proportionate demands on water and sanitary facilities are increasing even more rapidly because of industry's ever-growing need for water supply and waste disposal.

Over the past half century Lock Joint Pipe Company has helped keep pace with the requirements of a doubling population by supplying millions of feet of concrete pipe for vital water and sewer lines. Virtually 100% of these are still in service and are operating with the same high efficiency as the day they were installed.

This unexcelled record for economy, efficiency and safety certainly recommends Lock Joint Concrete Pressure and Sewer Pipe as the ideal material to implement the long range plans of water and sanitation officials to meet the growing crisis.

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ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Semiannual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

PROPAGANDA CONTEST?—Somewhere between viewpoints of groups that toured the USSR last year, the U. S. may get some idea of what the Russians are doing in power. Reports to be published February 16 by Edison Electric Institute on the tours of two groups of private utility executives may be the private-power answer to a January 4 report issued by a group of pro-public-power Senators.

NEW 'MAGIC' NUMBER?—The National Association of Home Builders may have decided to raise the housing starts "magic" number. It has been 1 million units. But in future congressional sessions, NAHB may "view with alarm" production of under 1.5 million.

BERING STRAIT DAM TO BE STUDIED—The U. S. State Department wrote Alaska Governor William Egan that a Soviet scientist's proposal for a dam across Bering Strait will be submitted to several U. S. and international scientific organizations for study. The July meeting of the International Union of Geodesy and Geophysics at Helsinki, Finland, might become a forum for discussion of the project.

MOON HOUSE ON DISPLAY—The model of an aluminum moon house, shaped like an elongated Quonset hut, went on display in Philadelphia this week. Air must be hermetically sealed within the building on the atmosphereless moon. A heavy canopy would shield moon pioneers from a steady bombardment of dust particles, solar radiation and temperature variations up to 400 deg F.

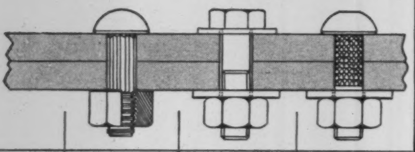
COYNE HONORED FOR KARIBA—Design of an African dam has won a British honor for French engineer Andre Coyne. At the request of the Rhodesian government, Queen Elizabeth named him an honorary commander of the Order of the British Empire in recognition of his work on Kariba Dam.

EJC GETS FOUNDATION FUNDS—In his speech as outgoing president of Engineers Joint Council last week, Enoch R. Needles revealed new uses to which EJC will put National Science Foundation money. One grant will send six EJC delegates to Russia next summer to report on utilization of engineers and technicians there. A second will send an EJC delegation of eight to Buenos Aires in September for a conference on engineering education.

ANYONE SUPERSTITIOUS?—The river dredge Clearwater settled quietly to the bottom of the not-so-clear Delaware River recently for the third time since last August. She was out of the overhaul yard after her second submarine venture when her over-zealous fire-fighters, extinguishing an engine room blaze, flooded the holds and sent her under for the third time.

the bolt on the right is new

COMPARISON TABLE



	DARDELET RIVET BOLT	HIGH STRENGTH BOLT	HIGH STRENGTH BEARING BOLT
ASTM designation	none	A 325	A 325
Comparative shear strength (¾" Dardelet=100%)	100%	159%	177%
Tensile strength	70,000 lbs.	90,000 to 120,000 lbs.	90,000 to 120,000 lbs.
Resistance to slippage	good	fair	excellent
Resistance to vibration	good	good	excellent
Men required to install	one	two	one
Equipment required	sledge and hand wrench	impacter and hand wrench	maul and impact wrench
Installation cost	equal to or less than rivets	less than rivets	less than rivets
Washers required	none	two	one

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Combines the tensile strength of a hex head high strength bolt with the bearing of a rivet.

Has the highest shear strength and greatest resistance to slip of all structural bolts.

Costs the same as the Lamson Dardelet Rivet Bolt (left) and the Lamson High Strength Bolt (center).†

Size for size, this new bolt costs the same as the other two, yet provides a more rigid structure at less cost. Field tests have proved its superiority, and already many structures have been erected using this bolt.

The new Lamson High Strength Bearing Bolt is available now through 20 U. S. Steel Supply Division Steel Service Centers in key locations throughout the country.

Write Lamson & Sessions for Bulletin HSBB. Contains pertinent engineering data. Firm names, and locations where these bolts have been used, will be mailed promptly on request.

**Pat. App. for*
†Cost based on using bolts with nuts and washers as shown.

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Plants in Cleveland and Kent, Ohio • Chicago and Birmingham

WASHINGTON OBSERVER

- Housing tussle starts in Congress
- Highway hearings start next week

● **The tussle over tight money and federal aid to housing starts got under way this week** when Rep. Albert Rains (D., Ala.) opened hearings on his proposal to vote Fannie Mae another $1-billion emergency fund with which to buy government-insured mortgages at par.

The Democrats are trying to prove that the Administration's tight money program will severely depress housing starts this year. But they aren't united on their strategy. Nor do they have the unqualified support of homebuilders on proposals to increase the flow of funds to private housing. In Chicago, the National Association of Home Builders was critical of tight money policies, but did not come out four-square for Representative Rains' mortgage market pump-priming (see p. 46).

The present outlook for 1960 is against the Democrats. The statisticians find that starts during the late months of 1959 held up better than expected, despite the increasing shortage of mortgages. As a result, 1959 finished second only to 1950's record of almost 1.4 million. Hence, the fear of a huge decline has softened somewhat.

The Democrats in Congress will keep hitting the issue, though, all through the session. They'll be keeping an eye on starts month-by-month, ready to push through a law despite threats of an Eisenhower veto.

The House Veterans Committee says the number of GI starts this year could be more than doubled if financing were available. Chairman Teague says a survey shows 368,000 loans could be made, compared with the 150,000 now anticipated for 1960.

Representative Teague's proposal would have VA float debentures, with the proceeds being invested in GI mortgages. This would do for the GI program much the same thing that the Rains bill would do for both FHA and VA. Standing a better chance—but also opposed by President Eisenhower—is the proposal to give World War II vets five more years to cash in on their housing benefits. This benefit is scheduled to die June 30 unless extended by Congress.

—

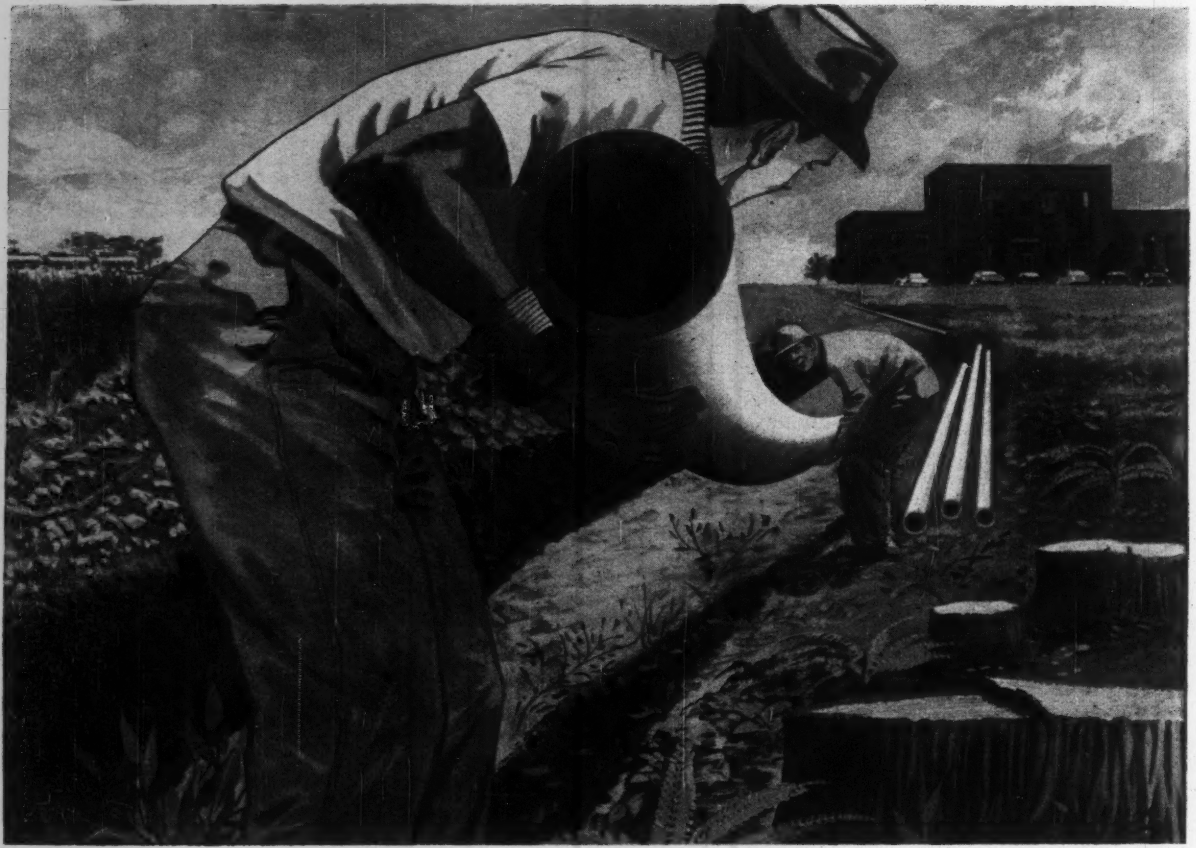
● **The special House subcommittee on highways is set to blast the Administration for its handling of clearances** on Interstate highway bridges. The subcommittee is tentatively scheduled to begin hearings next week—and the bridge-clearance issue is still undecided. The problem has been tossed back and forth between the Department of Commerce and the Department of Defense for months now.

Perkins McGuire, Assistant Secretary of Defense for Supply and Logistics, reportedly will be asked to testify on the matter early next month. He will be preceded by Highway Administrator Bertram D. Tallamy, Secretary of Commerce Frederick H. Mueller and other Administration officials.

The committee, which has scheduled hearings throughout this session of Congress, has asked Congress for $295,000 to carry it through the end of the year and to permit it to double its four-man staff.

The clearance issue is now sitting in the Defense Department, where Secretary Mueller sent it with a request for definite recommendations. Previously, Defense had said 17-ft heights were "desirable," but 16 ft was all that could be "justified" at present.

USCOLITE PLASTIC PIPE



*Commonwealth of Virginia, Hampton Roads Sanitation District Commission Treatment Plant at Foot of 44th St., Norfolk, Va.

Uscolite pipe solves an external corrosion problem for sanitation district

The Uscolite® pipe line installed in this treatment plant* carries 150 gallons a minute of a saturated chlorine water solution (actually treated sewage water) from the chlorinator to the main sewage line entering the plant.

Prior to installation of Uscolite, pipe severely corroded externally due to the chemical content of the soil and electrolytic action. *Uscolite has eliminated the costly maintenance and constant replacement of pipe.* Uscolite pipe was installed above and below ground because it is rigid enough to resist soil pressure, yet flexible enough to follow earth contours. UscoWeld† Fittings were installed in a fourth the usual time, saving many dollars. The welds are as strong and permanent as the pipe itself. Clamp-type fittings that leak, pull off and impair flow are never needed. *Not one foot of Uscolite Pipe has ever failed in service, when used in accordance with our recommendations.*

USCOLITE ELIMINATES COSTLY PIPE INSTALLATION

Superintendent of this plant says: "The simplest 'big' piping job we ever performed. Four men laid 1000 feet of 6" pipe per day without a sweat."

• • •

When you think of plastic pipe, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial plastic products.

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WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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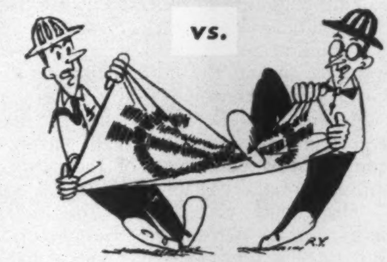
The Highway Dollar:

Consultants . . . vs. **. . . State Engineers**

"Accounting practices of most government agencies don't reveal true engineering costs."



"If services were performed by state highway departments, there would be no element of profit."

Which Can Stretch It Further?

Consulting engineers struck back on a broad front last week against federal and state officials who have charged that their services cost too much and result in additional expense in the Interstate highway program.

The American Institute of Consulting Engineers, the American Road Builders Association and the American Society of Civil Engineers made almost simultaneous rebuttals to what they consider a campaign to eliminate consulting engineers from the public works construction field.

The General Accounting Office and the House Appropriations Committee are credited with raising the question of consultants vs. permanent engineering departments to the level of heated controversy.

Comptroller General Joseph Campbell criticized the use of consultants in a recently released report on the conduct of the Interstate highway program in Pennsylvania, West Virginia and Maryland.

"The use of consulting engineers results in additional cost to the states and the federal government, by reason of the overhead and profit included in the fees normally charged by such firms," says the report.

"If all required engineering services were performed by the respective state highway departments, there would be no element of profit in highway costs," the report says.

The House Appropriations Committee asked for full-scale investigations of government agencies using consulting engineering and architectural firms. Legislatures in several states have taken up the anti-consultant cry, adding to charges of excessive cost the accusation of political patronage.

All of these statements are "irresponsible and misleading and neither supported nor supportable," says a resolution passed by AICE at its annual meeting last week in New York City.

Institute officials announced that they will have members available for testimony at any hearings on the question of consultants vs. staff engineering departments.

The AICE resolution states that current criticisms of consultants "are directly contrary to the cost experiences of government agencies which in the past have elected to perform with their own staffs engineering work which could have been accomplished as well or better by engineers in private practice."

The resolution further charges that the accounting practices of most government agencies don't tell the true story about engineering costs and the overhead involved.

The American Road Builders Association jumped into the battle, although somewhat less positively than AICE, on the side of the consultants last week at its annual convention, held in Cincinnati (see p. 42, 43).

ARBA called for the establishment of a uniform system of accounting engineering costs that will show the direct and indirect costs to the taxpayers for engineering services on all federally aided highway projects, whether they are provided completely or partially by federal engineering department forces, state highway department staffs or private consultants.

The American Society of Civil Engineers executive committee issued a policy statement on the matter in the current issue of CIVIL ENGINEERING. The statement contends that it is most economical to engage consultants to handle extra work (ENR Jan. 21, p. 17).

"It is unrealistic, economically unfeasible and at variance with good professional practice for public agencies to expand their engineering organizations during periods of peak demand and then try to maintain them or, equally bad, cut them back during slack periods," the statement says.

ASCE policy suggests that a permanent staff should be large enough to take care of a minimum constant load.

The executive committee also draws attention to the inadequacy of cost records at various levels of government. It says that much information is available to indicate that costs are often less in private firms than in government bureaus, particularly when indirect costs are properly recognized.

Federal Highway Administrator Bertram D. Tallamy and his Bureau of Public Roads take a position on the fence, but still disagreeing with GAO.

BPR is revising a 1956 policy statement that encourages states to increase their highway staffs to handle expanded highway programs. The new statement won't be radically different, but it will make clear that consultants belong in the federal-aid program and that BPR doesn't go along with the GAO claim that some consultant fees have been excessive or are likely to become so under present procedures.

The new document won't suggest relaxing the requirement that states have adequate highway departments to assure continuity of planning, but it will endorse employment of outside consultants to strengthen highway engineering accomplishments of the state departments.

The American Association of State Highway Officials refused to take a stand in the debate, claiming it has no policy on the use of consultants.

California is among the several states that have strong legal limitations on the use of consultants. In other states, such as New York, private engineers do as much as 80% (by dollar volume) of the design work.

Pennsylvania has leaned heavily on consultants for its highway work for a number of reasons, most of them centering on a lack of adequately trained personnel.

This week in Harrisburg a Joint House-Senate Committee on Highways held hearings as a result of the critical GAO report on the state's policies regarding consultants. Witnesses will include C. E. Fritz, of the Automotive Safety Foundation; G. S. Richardson, Pittsburgh consultant; and Park Martin, Secretary of Highways.

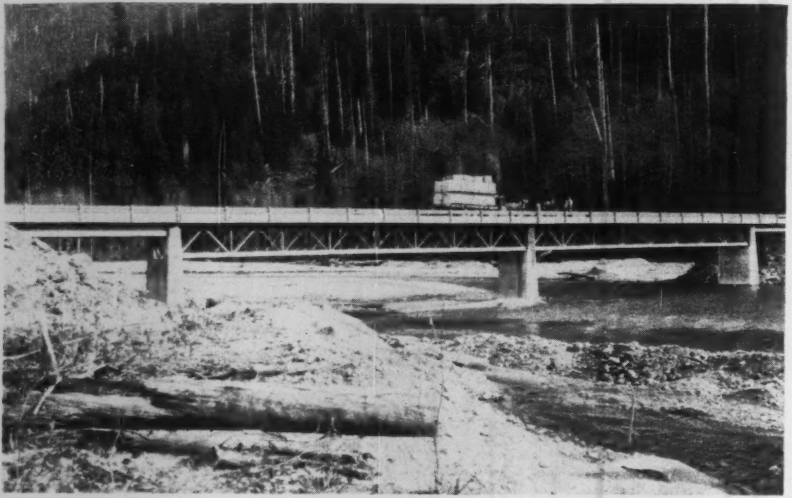
The New York State Senate has been interested in the hiring of consultants. But apparently its membership can't decide how to approach the situation.

The body last year ordered an investigation of the state's Department of Public Works practices in letting consultant engineering contracts. The order resulted when it was reported that $66 million worth of these contracts were let during the administration of Gov. Averell Harriman.

According to leaks in Albany, the report criticizes the practice of paying consultants a percentage of their own estimate of the cost of a project.

The report, according to the leak, hasn't come across any malpractice. But there is some fear that part of the report may be libelous, and so far it has been passed from legislator to legislator, committee to committee, and no one is ready to release it.

Some New York legislators see the consultants fees as a chance for some persons to pay off political obligations.



A First in U.S. Bridges

This single-lane bridge on a logging road in Washington State is the first in the U. S. to be built with composite steel and prestressed concrete trusses.

The bottom chords of the trusses are post-tensioned concrete, 12 in. by 17 in. in cross section. Other truss members are structural steel.

The bridge has a total length of 270 ft, compressing two 35-ft prestressed concrete end spans and two 100-ft channel spans. Trusses have an over-all depth of 7 ft and are spaced 8 ft on centers.

The contractor—Associated Sand & Gravel Co. of Everett—bid the job at 12% less than an alternate design calling for all prestressed concrete.

The comparatively light trusses were fabricated in Everett, tied together with temporary bracing, and brought to the remote bridge site in a single truckload, with the aid of a steering trailer.

Erection of the trusses and placement of 26 precast concrete slabs for the deck was completed in two days. Homer Hadley, Seattle consulting engineer, designed the structure.

ARBA Gets

Members of the American Road Builders Association—engineers, contractors, equipment manufacturers and materials suppliers—are in full accord on one point: Highway construction in 1961 must be stepped up to a faster tempo than this year. And groundwork must be laid now to insure continued acceleration at least until our $41-billion system of Interstate highways is completed.

Much of the discussion among the 1,200 persons who last week attended the 58th annual convention of ARBA in Cincinnati centered on how to achieve this goal.

The problem of greatest concern today, as it was at last year's convention in Dallas (ENR Jan. 29, 1959, p. 22) is adequate financing. This isn't a new problem; it's just getting to be a tougher one.

Obviously, the answer lies with Congress. "Unquestionably, 1961 will go down in roadbuilding history as the year of congressional decision," said ARBA's hard-hitting executive vice president, Maj. Gen. Louis W. Prentiss (USA-Ret.).

By next year studies and investigations now under way on various phases of the highway program will be concluded and presented to Congress.

"To meet these challenges," warned General Prentiss, "we must make 1960 a year of concerted action—not only constructionwise, to demonstrate the industry's vast capacity and resourcefulness in that direction—but also in public dedication.

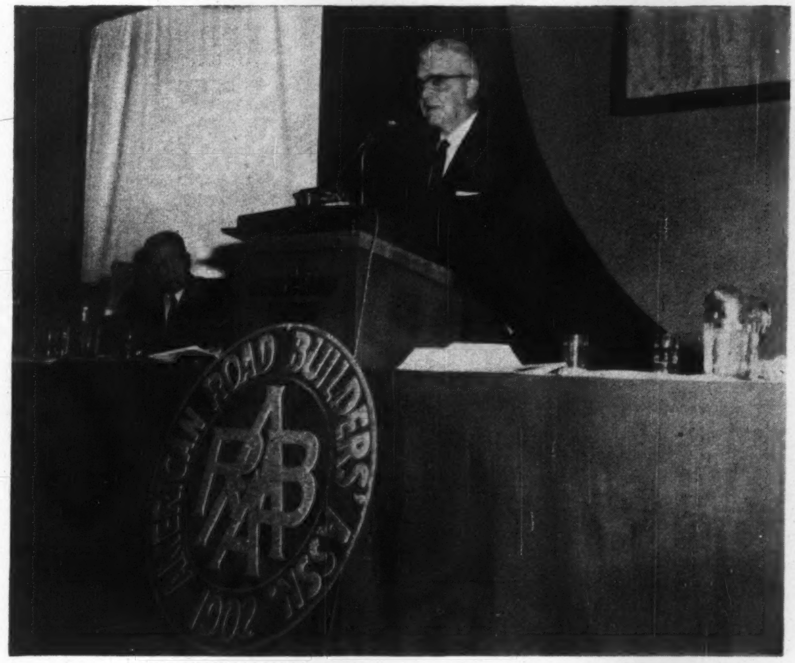
"Unfortunately, most of the published material on the Interstate highway system to date has stressed its tremendous size and cost. Little has been said about its even more tremendous benefits."

To do that job, ARBA's Public Relations Advisory Committee has formed a Better Highway Information Committee, which will inform the general public on highways. However, this new commitee will have no lobbying functions.

Nello L. Teer, Jr., reelected to serve a second term as ARBA president, warned that "highway needs are presenting grave financing problems at all levels of government." At the same time strong forces are at work to cut back the highway program in the name of economy.

"Construction economy can be maintained," declared Mr. Teer, "but it calls for long-range provision for financing roadbuilding programs without interruption; long-range planning including accurate forecasts of traffic volumes; and adequate construction programs,

Set to Counter Road Critics



Contractor John P. Moss calls on roadbuilders to cut costs.

balanced to meet the determined needs."

Support for Mr. Teer's contention that vigorous action is needed on the part of ARBA to combat criticism of the highway programs, was contained in a paper prepared by Bertram D. Tallamy, Federal Highway Administrator, and presented by his special assistant, Robert M. Monahan.

"Although we have had to limit the obligation of Interstate highway funds by the state highway departments to $1.8 billion for fiscal 1961—and to schedule payment of it, as well as $900 million for the ABC programs on a quarterly basis—it is no cause for panic. Although this is a moderate cutback from the original plan, it has generated a lot of loose talk, hysteria and confusion about the highway program."

Although Mr. Tallamy said he would not guess about new legislation this year, he did predict that the Bureau of Public Roads would be able to apportion $2 billion of the authorized $2.2 billion for Interstate highways in fiscal 1962.

One answer to faster and more economical highway construction lies directly in the specifications by which they are built. The answer, according to H. A. Radzikowski, chief of the Development Division of BPR, is more "end-result" specifications in lieu of current restrictive requirements.

"Larger volumes of highway construction will be possible only by each segment of the industry assuming its responsibilities," said Mr. Radzikowski. "This means that the manufacturer must produce and improve more construction machinery; contractors must employ more efficient construction methods; and highway departments must furnish up-to-date specifications.

The use of more end-result specifications will encourage further economies in roadbuilding by stimulating the ingenuity of the contractor. To the highway engineer, improved equipment means lower unit cost, improved quality and faster construction. But from the contractor's standpoint, he must have assurance that when he buys new machinery the road specifications will permit its usage without too many restrictions," said Mr. Radzikowski.

The importance of quality control was stressed in a paper prepared by E. S. Preston, Ohio Highway Director, and delivered by his deputy, C. W. McCaughey.

Better quality control during construction means a future savings in maintenance costs, while improved testing methods would cause fewer delays in construction operations. Developing and adhering to standard specifications that represent accepted construction practices also will improve quality control, said Mr. McCaughey.

Roadbuilders emphasized the vital importance of urban sections of the federal-aid program. Members of ARBA went on record ". . . that the construction of the system of Interstate and defense highways go forward as originally contemplated, including urban construction as a vital part thereof. Construction of such urban connections is and should be an integral part of the total system . . ."

And "while the proposed urban connections are recognized to account for a major portion of the total cost of the system, their existence will constitute a far greater contribution in benefits per dollar investment to the expanding national economy . . ."

Rep. Gordon H. Scherer (R., Ohio), ranking minority member of the House Subcommittee on Roads, endorsed urban phases of the program in these words: "Above all, let's not put our heads in the sand and, in an effort to get miles of pavement laid, curtail the building of the Interstate system in urban areas where the actual traffic bottlenecks and high accident rates exist."

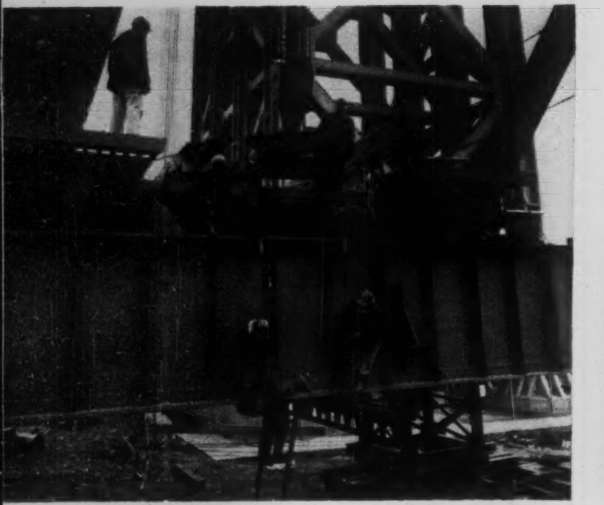
Later, Sen. Dennis Chavez (D., N. M.) and Rep. George Fallon (D., Md.) took substantially the same position.

This year's annual meeting marked the 25th anniversary of the ARBA's Education Division. The occasion was marked, quite properly, by thought-provoking papers at technical sessions of the division.

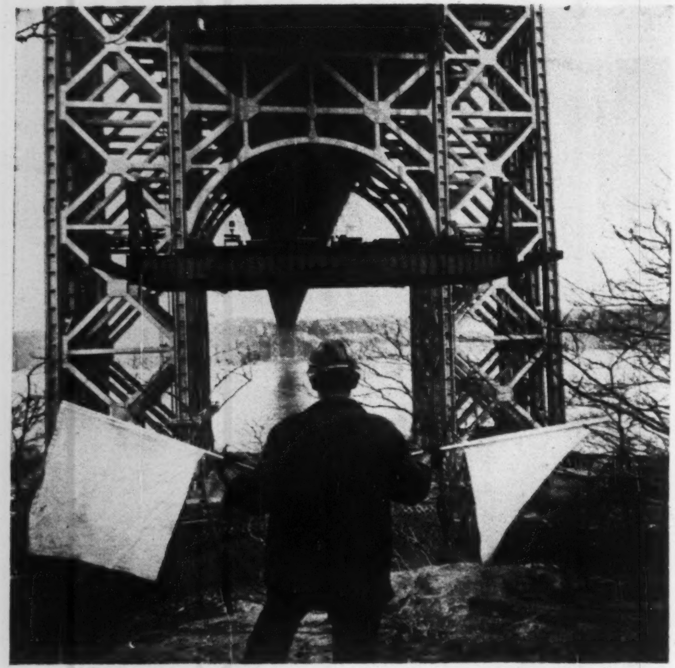
Sounding the keynote of "education in the highway program" was Emmett H. Karrer, professor of highway engineering, Ohio State University, who was reelected to a second term as president of the Education Division. He declared that construction education is a two-way medium. Colleges need practical help from contractors to better educate undergraduates in highway engineering. And contractor organizations can benefit from educational training available from engineering colleges.

One of the convention highlights was a question-and-answer session involving Sen. Chavez, Rep. Fallon, and Rep. Scherer, and representatives of the construction press. Sharpest exchange of view came on the question of "reimbursement planning." The two Democrats felt, in effect, that contract control was a breach of faith with the intent of Congress, as expressed in the 1956 act, while Rep. Scherer endorsed the system as necessary to keep the program on a "pay-as-you-go" basis.

Two new vice-presidents were elected to serve under President Nello Teer. They are Armand Keeley, president, Prismo Safety Corp., and George M. Foster, executive director, Indiana State Highway Department.



Lower-deck section is prepared for lift.



Signalman checks to see that the rising unit is level.

Big Lower-Deck Bridge Section

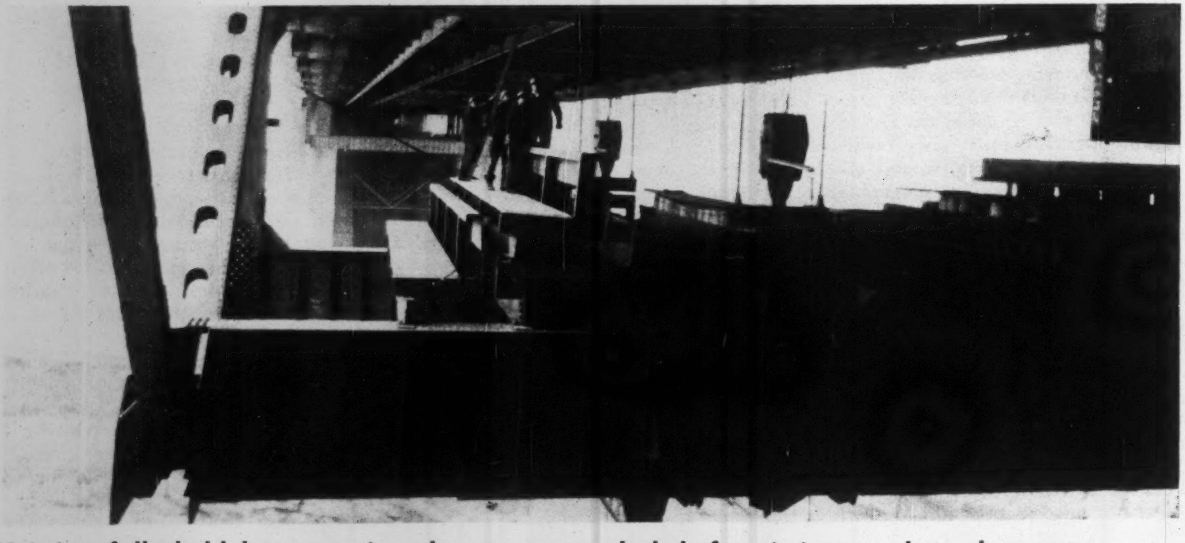
In a dramatic and suspense-filled 26-hour operation that started on a cold clear morning and carried on through a night of rain, sleet, ice and wind, 25 men last week placed the first of 76 structural steel sections that will support the lower deck of the George Washington Bridge.

The section is 90 ft long, 108 ft wide and 30 ft deep; it weighs 220 tons. It was assembled on the ground adjacent to the New York tower, raised vertically on a four-point pick-up and then rolled almost 600 ft from the tower to its final position at the east abutment while traffic was detoured from the highway beneath.

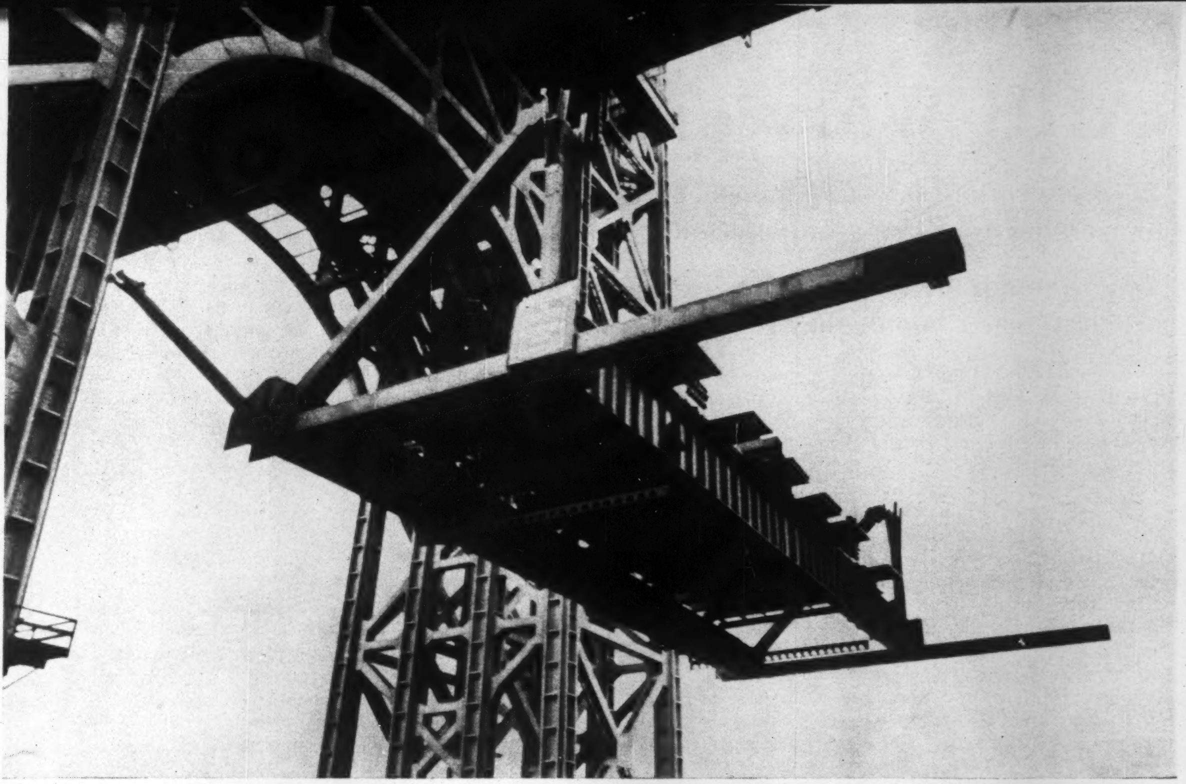
The unit consists of two built-up girders, two posts, four diagonals, two 60-ft box-section lower chords, and a floor system including lateral bracing, stringers, grid floor, and sidewalk base.

Lifting the section to its initial resting place beneath the existing roadway took only one hour and 45 minutes. Moving it from the tower to the abutment took less than 40 minutes. Fixing the section required eight hours; the rest of the time was for wait and worry.

The heavy section had to be raised



Hoisting falls hold lower section close to upper deck before it is moved to abutment.



Massiveness and completeness of lower-deck section can be seen in this view.

Is Raised and Rolled Into Place

during the daylight hours, when its progress could be watched closely. But it then had to be moved beneath the back span over a main line of the New York Central Railroad and the southbound lanes of the extremely busy Henry Hudson Drive. During daytime hours this movement would pose a serious threat to both rail and vehicular traffic. It was decided therefore to move and fix the section between 1:00 a.m. and 6:00 a.m. Work started on time but weather and job conditions brought a three-hour delay.

The lifting and carrying mechanism consisted of two 106-ft-long trolleys similar to overhead cranes. These trolleys travel on 24 WF 76 beams temporarily suspended from the upper deck of the bridge. These beams will later be lowered to the bottom deck, where they will serve as deck stringers.

Each trolley carries a 200-hp, three-drum hoist. Two of the drums handle the two 15-part hoisting falls; the other controls a double whip pulling line that passes through a sheave at the anchorage and returns to dead end at the trolley.

Steel work is being done by Bethlehem Steel Co. under the direction of C. E. Adams. H. A. Druding is resident engineer for the Port of New York Authority. O. H. Ammann is consultant.

Tough aligning job begins when unit reaches abutment.

NAHB Wary of ‘Emergency’ Aid

- **Convention skirts endorsement of a House bill similar to 1958’s “antirecession” measure.**
- **Although the homebuilders expect a decline from last year’s boom, they’re not pessimistic.**

The homebuilding industry apparently will speak softly and guardedly when it asks Congress for measures designed to ease the present tight mortgage money market. Tip-off came last week in the 1960 policy statement of the National Association of Home Builders, which met in Chicago.

The statement may give some of private housing’s strongest supporters in Congress the feeling that builders pulled the rug from under them.

The statement is not the lengthiest ever written by NAHB, but it is the most indirect, indeed the most diplomatic. It is also the first to devote most of its content to the fiscal policies of an Administration in office and the banking and credit system of the nation.

But significantly, it fails to give forthright support to the “Emergency Home Ownership Act” sponsored by Rep. Albert Rains (D., Ala.), chairman of the House Subcommittee on Housing. The key provision of that bill would provide $1 billion to the Federal National Mortgage Association (Fannie Mae) for the par-purchase of government-backed home mortgages of $13,500 or less.

That was done in 1958, and the move is generally credited with bringing housing out of a slump that year. Some members of Congress believe that the action must be repeated if a predicted decline in housing starts is to be prevented this year.

The builders’ organization is not bluntly rejecting the proposal, however. It just walks around the topic. As presented in the policy statement it shows up as a well modified, last-resort alternative to two other recommendations. The other recommendations would either be ignored by Congress or, if passed, would not provide quick relief.

The recommendations are:

- Authorize the National Service Life Insurance Fund to invest “a reasonable proportion of its funds” in long-term Fannie Mae debentures so that the agency could buy VA mortgages.
- Allow the Veterans Administration and the Federal Housing Administration to recognize mortgage discounts as a cost of building a house.
- Or, as a “last resort,” Congress should provide Fannie Mae an adequate fund for use in areas where home mortgages are not available at reasonable prices. The fund should be regulated so as to “prohibit a disproportionate use of funds by any single builder.”

The “last resort” recommendation is the closest NAHB comes to supporting the Rains bill.

Spokesmen for NAHB say that refusal to ask for such monetary aid openly reflects members’ fears of being tagged as a “subsidized” or special group.

No one denies builders had a good year in 1959. Housing starts, estimated at 1.3 million, represent the second best year on record. Moreover, the predicted 10% decline this year would still mean 1.2 million private starts.

Many members of NAHB say that this is not the time to ask for the type of aid that in 1958 was frankly labeled “antirecessionary.” The document finally approved by the 452-man board of directors therefore reflects the wary views of the general membership.

Questioning by ENR of a large number of builders from all parts of the nation attending the NAHB convention disclosed no deep pessimism.

There is general agreement that housing starts this year will decline, but builders in some regions felt that in their own area starts would equal those of 1959, perhaps surpass them.

Southern California builders are optimistic. This year will be as good “if not better . . . than 1959, even though it is possible the national average of starts will drop somewhat,” according to Ray K. Cherry, president of the Home Builders Association of Los Angeles, Orange and Ventura Counties.

Other builders from that region supported Mr. Cherry’s optimism by forecasting a boost in their own operations and those of their competitors. They agree money “will be expensive,” but it will be available. Few feel the high cost of obtaining a mortgage will discourage families seeking a new house.

“Our population in Southern California continues to grow by in-migration. Those people need some place to live, and what’s more they usually have a fairly good chunk of cash obtained from the sale of the house where they formerly lived,” is the reasoning of one Los Angeles County homebuilder.

Another builder thought that congressional action on removing the interest rate ceiling of 4¼% on long-term government bonds would help bring down the cost of mortgage financing.

“Congress is partially to blame for what it did not do in the 1959 session. It did not eliminate or raise the bond-rate ceiling, so the Treasury kept taking short-term money out of the market at a constantly higher interest rate,” he said.

Builders in the Southwest also expect to equal or better 1959. “We’ll do better this year than last, and 1959 was a good one for us,” says the executive officer of the Houston builders’ organization.

Philadelphia and its surrounding communities are expected to provide builders with a good market this year. “There may be fewer starts numerically, but the dollar volume of private home construction will be the same or higher. So the upgrading of the market will provide us with profits equal to last year,” according to one large builder in the region.

Dollar volume and—more important—profits are the keys to a businessman’s decision on whether a given year will be good or bad. And generally, builders feel the profit aspect will be better.

Some builders indicated that although builders’ housing starts were large last year, their profits left something to be desired.

The net will have to be improved by either higher prices on their product, an overhaul of management operations and building techniques, or a combination of the two.

Many indicated that anything they might do to reduce operating costs could be offset by high discounts that are a requisite to getting a buyer an FHA or VA mortgage.

This out-of-pocket cost to the builders will therefore force them to serve that part of the buying public ready, willing and able to purchase a house with a conventional mortgage. This trend will be a factor in the housing decline expected this year.

Such financing is quicker, cheaper and almost painless so far as the builder is concerned. Right now, builders say they are being strangled by the rules, regulations and red-tape that characterizes the FHA and VA housing market.

NAHB notes the complaints in its policy statement and urges that the Federal Housing Administration “immediately revise its regulations and procedures in order that it may again become a fully effective force for home ownership . . .”

Soviets Get Aswan Second Stage

To the great surprise of almost no one, Russia has scrambled from a fairly firm toehold to a secure footing at Aswan High Dam.

In an informal agreement made via an exchange of letters between Premier Khrushchev and President Nasser, the Soviet Union has agreed to finance construction of the second-stage work, which includes the main dam and powerhouse.

The exact amount of the loan is to be negotiated, but estimates place it in the neighborhood of $300 million. Terms are understood to be similar to those for the $100-million loan for the first stage—repayment at 2½% interest in 12 annual installments beginning two years after completion of the phase financed by the loan.

Despite Russia's acknowledged inside track on the second stage, private competition remained sharp to the end. Firm offers on parts or all of the second stage were made by companies from West Germany, Italy, Japan, Great Britain, France and Australia.

There is still a very important Western finger in the pie, however. Sir Alexander Gibb & Partners of London, are designing the second stage. The Gibb firm has done the design work on all phases of the project up to now, with the advice of an international consulting group—I. C. Steele, Lorenz G. Straub and Karl Terzaghi of the U. S.; Andre Coyne of France; and Max Pruess of West Germany.

Soviet engineers made certain modifications of the first-stage design, however, so it is quite likely that the consulting board, or some members of it, will sever connections with the Aswan project in the belief that their recommendations would be ignored, or that they would be unjustly blamed if troubles develop.

Working designs and specifications for parts of the first stage are expected to be completed shortly in Moscow. When they arrive in Cairo, the Egyptian High Dam Authority will prepare work schedules and parcel out the work to contractors. Final designs must wait for results of hydraulic tests now in progress in Russia.

In pursuit of the second-stage work, the Soviets did their best to undermine confidence in Western engineering competence. Ivan Kumzin, heading the Soviet supervising team, said the Western plan required "serious corrections." Nicolai Malychov, Soviet chief engineer for the first-phase work, said the Gibb design was made without regard for the "vast experience of hydrotechnical construction in the Soviet Union."

Malychov singled out the diversion tunnels and cofferdam design for particularly critical comment.

The shape and construction of the tunnels would have reduced by 100,000 kw the eventual generating capability of the new hydro station just started up this month at the 58-year-old existing Aswan Dam, he said. (A major Soviet change in the Western plan was substitution of a concrete-lined channel for the seven diversion tunnels.) Construction of the tunnels would have been very difficult because they were all below river level, he said. And steel control structures in the tunnels could not have been protected from cavitation.

Western opinion has suggested that the Soviet switch from tunnels to an open channel stemmed from Russian experience in tunneling.

Malychov called the Western cofferdam plan too complicated and too slow to carry out. The Western plan for the upstream cofferdam called for a rockfill core resting on an inverted filter. The rockfill's upstream side was to support a wedge-shaped body of vibrated dune sand covered with silt.

The Soviets propose to do away with the filter and dump first rock, then sand (ENR Jan. 21, p. 26). Water currents are expected to carry the sand into the rock interstices and create a barrier to flow. Soviet sources say this method is without precedent anywhere but that tests near Moscow on a 1:120 scale model of the dam have proved the method feasible for the Aswan cofferdam. A U.S. source says the method has been used for small dams elsewhere but not on the scale proposed at Aswan.

One Soviet selling point in competing for the second-stage work was a promise to speed it up. Without splitting of contracts or supervision, they said, the job could be done in seven years instead of ten.

The Russians also gained an advantage from the excess of foreign exchange provided to Egypt by the Soviet first-stage loan. Ahmed Said, Egyptian engineer-in-charge, declared that the first-stage loan was about three times the amount of foreign exchange needed for that stage alone. The excess was, therefore, available for purchase of Soviet equipment and technical skill.

The new powerhouse officially started up last month at the old Aswan Dam, five miles downstream from the High Dam site. It is the first exploitation of power from the old dam. Two units are now operating. Egypt plans to have the plant completed this year. It will have capacity of 350,000 kw.

The powerhouse to be built as part of the Aswan High Dam second stage will have 16 turbines of 120,000-kw capacity each.

Both stages of Aswan High Dam construction will result in greater power production at the smaller plant downstream. First-stage completion will add about 600,000 kwh a year. Second-stage completion will add another 320,000 kwh a year.

Water-Plan Critics Get Answer

California's Gov. Edmund G. Brown has laid down sale policies for water and power from the state's huge water development program. The move is made to quiet some of the strongest critics.

The governor made two major points:

- "Differential water rates" will prevent "unjust enrichment" of big landowners.
- Hydropower produced by the project will be sold at "market value" to "keep down the price of water."

The governor said he will not call a special session of the legislature in March, as urged by the state AFL-CIO. The labor organization wanted the session to settle policy controversies before next November, when California citizens will vote on a proposal to issue $1.75 billion worth of bonds to finance the water program.

Public agencies will get preference in sales of excess power the governor said.

Governor Brown contended there is no reason to get involved in the public vs. private power controversy in the state's water program because after the first few years water transmission will require more power for pumping than the project can produce.

The governor said he believes it "fair and workable" to charge large landowners higher rates for water rather than deny them benefits of the project.

Water Resources Director Harvey O. Banks and Ralph M. Brody, special counsel to the governor on water problems, expanded on the governor's statement of principles. They announced the state will proceed immediately with contract negotiations for water delivery to local agencies that want water.

Before any construction financed by bond proceeds can start, they said, local agencies will have to guarantee the state at least 75% of the cost of transporting the water.

Water cost will range from $3.50 to $70 an acre-ft, depending on the delivery distance. Owners of tracts greater than 160 acres will have to pay $2 to $3 an acre-ft more than small holders.

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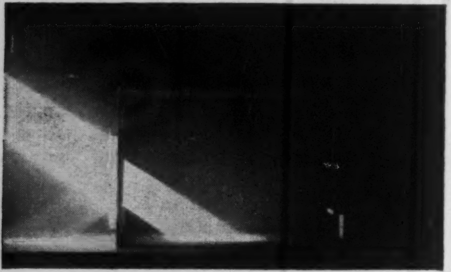
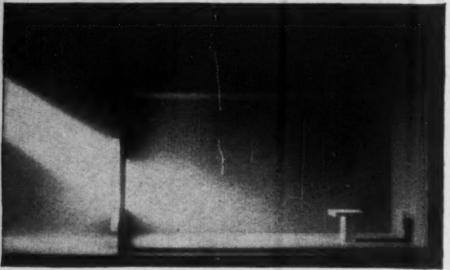


Photograph shows "Smoke Box Room" with its window glazed with clear glass.



Smoke Box photo showing window glazed with a diffusing glass.

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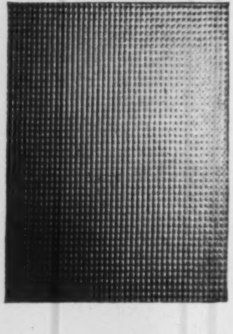

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World Bank Checks Design Of Four Arch Dams

The World Bank has begun a design recheck of four concrete arch dams for which it has loaned funds.

Although the check was decided on as a consequence of the Malpasset Dam failure in France, it does not mean there are any specific doubts about the design adequacy of any of the structures involved. But the World Bank feels an independent check would bring desirable reassurance.

Construction is just beginning on all four projects. They are: Dez Dam, in Iran; Kurobi Dam, in Japan; La Soledad Dam, in Mexico; and Rapel Dam, in Chile.

Rapel was designed by Andre Coyne of France, the designer of ill-fated Malpasset. Carlo Semenza of Italy designed the other three.

An international consulting board, appointed to carry out the investigation, held its first meeting in Washington last week. Members are Henri Gicot and Alfred Falconnier of Switzerland, Claudio Marcello of Italy, Julian Hinds, John J. Hammond and Edward B. Burwell, Jr., of the U. S.

Mr. Burwell and Mr. Falconnier are geologists; the others are experts in the field of dam design.

Philadelphia's Rail Plan Could Set Urban Pattern

A non-profit corporation chartered last week in Philadelphia could set a pattern for integrated commuter services throughout the metropolitan areas of the U. S.

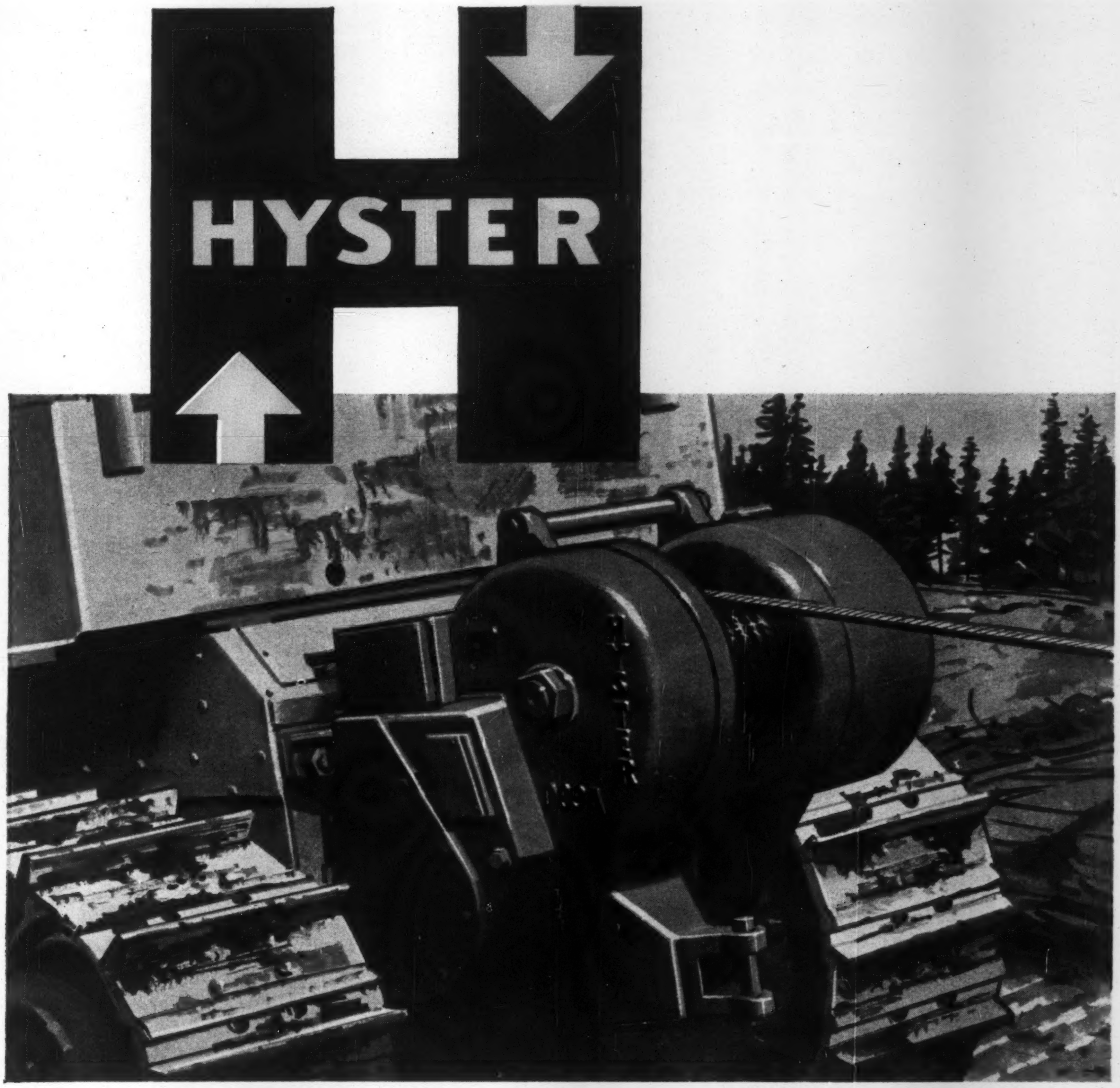
The organization, called Passenger Service Improvement Corp., has been set up to run within metropolitan Philadelphia the commuter rail lines currently belonging to two separate railroads, the Reading and the Pennsylvania.

Extension of the plan to suburban areas outside city limits is already under consideration.

The plan, believed to be the first of its kind put into operation in the U. S., has been undergoing trial since October of last year. Here's how it works:

The railroads that own the requisite trackage turn over to the corporation the operation of all commuter services. The corporation in turn guarantees the railroads an annual fee for use of the tracks. This fee can vary with revenues collected, but only within a predetermined maximum and minimum range. In addition, the railroads are granted specified subsidies.

In the case of the Philadelphia operation, the city underwrites the difference between operating costs and the return needed for a profit.



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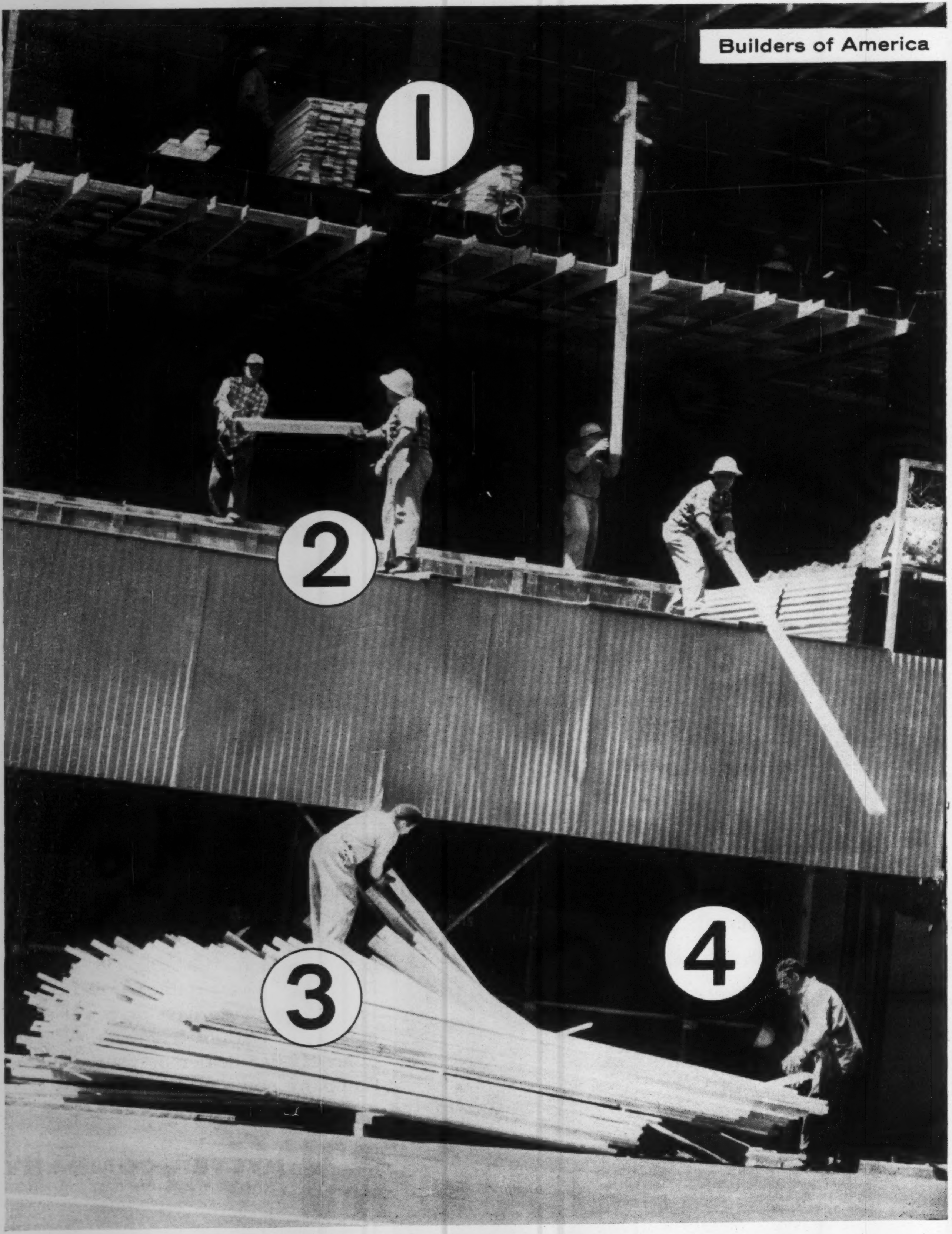
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85th Annual Report and Forecast

Construction's Target for 1960:

A Boom That Will Last

There is no lack of encouragement from business leaders and economists for viewing 1960 as a boom year. Even the President has said that "1960 will be the most prosperous year in the nation's history."

However pleasant it is to accept these predictions—and there is much to support them—there is an important postscript: Any boom we have should be made to last. In so far as construction is concerned, continuous, even growth should be its target. A roller coaster economy is the worst kind for construction to cope with.

There can be no question but that 1960 starts off with glowing prospects. The longest steel strike in history has ended. Consumer income is at a record high level. And industry is confidently planning to continue its large investments in new plant and equipment.

To swell this ripening private harvest, governments—state, local and federal—are committed to spend several billion dollars more than they did last year. It all adds up in the economists' tote books to a Gross National Product of $515 billion compared to 1959's sizable $480 billion.

If this is encouraging for the economy as a whole it is equally encouraging for construction, which normally accounts for about 12% of the GNP. In 1960, every category of construction will contribute more than it did last year, with the notable exception of housing. As detailed on another page, the total increase in heavy construction contracts is estimated to be 6%. The $21.6-billion total will be only $0.1 billion off the all-time record of 1956.

With such rosy prospects what are the problems? The principal one, if the objective were to push construction to the highest possible level, would be money—tight money in the mortgage field and high-cost money for state and municipal borrowing. Viewed in the light of a boom that will last, however, postponement of some projects until money markets are more favorable may be an advantage. And in any event this is a problem outside the realm of construction industry solution.

The real problem for construction to solve is that of paying more for its labor, equipment and materials while charging customers less for its finished products. Unreasonable as this is, it is vitally necessary if the boom is to last.

To its great credit, construction was more successful in this respect last year than ever before. Intelligent design, efficient and ingenious construction and wise management paid off. These are the tools that will have to be used again, and even more effectively, in 1960 if construction is to be on target in fashioning a boom that will last.

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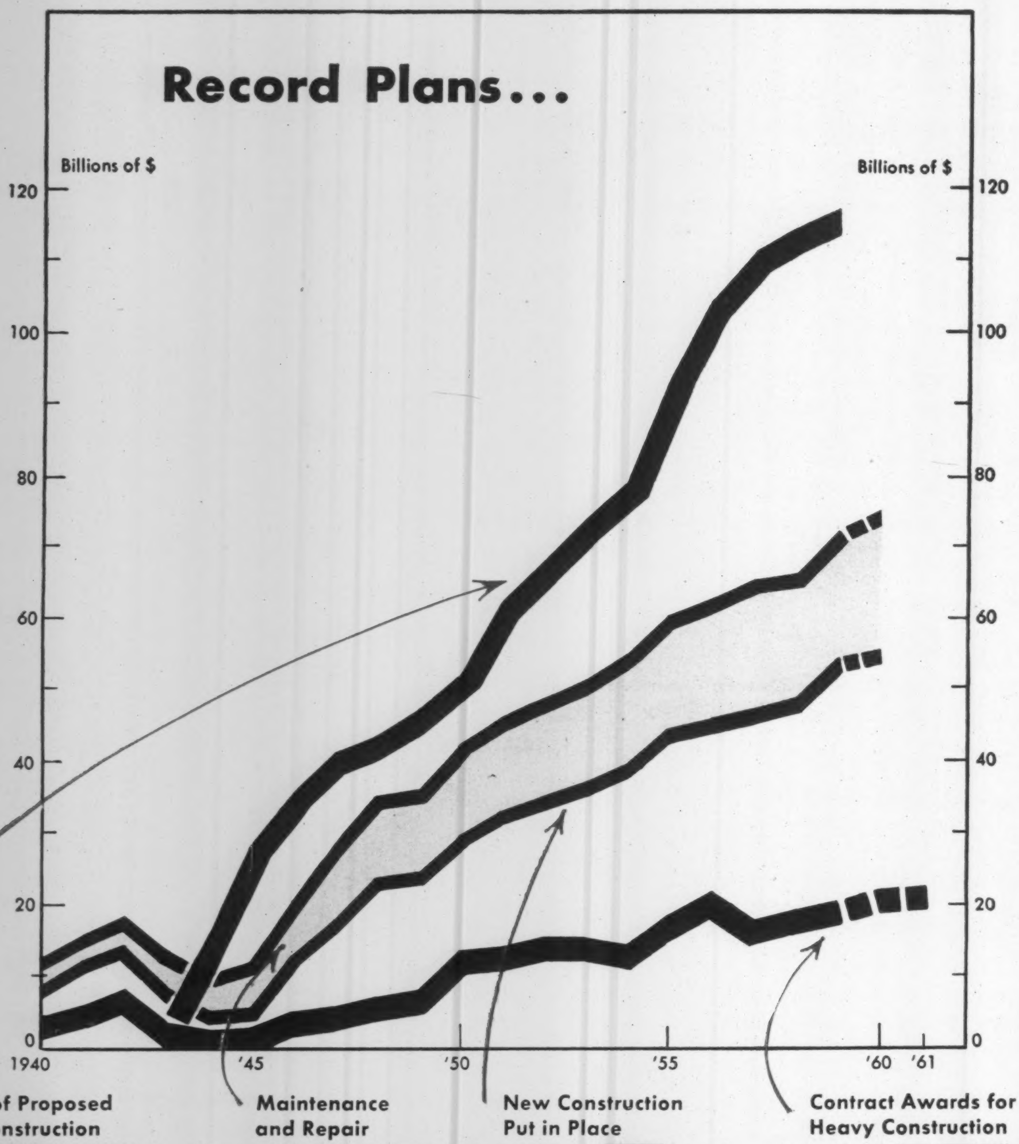
Major Transportation Projects 141

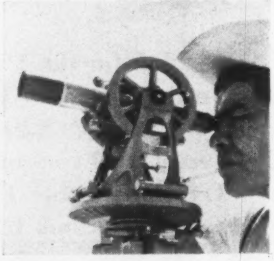
Job for the '60s: Replace Worn-



Planning Ahead... Plans are already underway or completed for construction to cost an estimated $118 billion.

Spending... Estimates of upkeep spending rise with soaring investment in all types of construction.

Work put in place estimates show how construction pours money into the national spending stream.



Going Ahead... Contractors' new business brings new orders for materials, equipment, manpower and money.

Out Plant; Pace the Coming Growth

...for Record Contract Awards

Heavy Construction Contracts Forecast† (in millions)

	1959 Actual	1960 Forecast	Change '59-'60 %	1961 Forecast	Change '59-'61 %	
All Heavy Construction	$20,433	$21,890	+ 7	$22,690	+11	New record by '60...
By Ownership						
PRIVATE	10,431	11,180	+ 7	11,520	+10	...as private leads and...
PUBLIC	10,002	10,710	+ 7	11,170	+12	
State & Municipal	7,170	7,755	+ 8	8,205	+14	...public stages comeback
Federal	2,832	2,955	+ 4	2,965	+ 5	
By Type of Work						
PUBLIC						
Waterworks	376	450	+20	500	+33	Steady growth here
Sewerage	655	725	+11	770	+18	
Bridges*	570#	765	+34	705	+24	
Highways	2,899	3,380	+17	3,565	+23	
Earthwork, Dams, Waterways	915	955	+ 4	1,160	+27	They'll bounce back in 1960
Buildings:						
Excl. Housing	2,604	2,430	−17	2,480	− 5	
Housing	591	480	−19	440	−26	
Unclassified	1,404	1,535	+ 9	1,560	+11	Rides missile work boom
PRIVATE						
Buildings:						
Mass Housing	4,701	3,980	−15	5,207	+11	Easier money by 1961
Commercial	2,161	2,510	+16	2,611	+21	Successive new highs
Industrial	3,003	4,045	+35	2,931	− 2	Peaking out in 1960
Unclassified	554	635	+15	761	+37	

†50 States, including Alaska and Hawaii, plus Dist. Columbia. *Includes private bridges.

#Does not include $126-million Chesapeake Bay Bridge-Tunnel contract, which has been removed from these statistics until the bonds are sold.

Construction, the nation's largest fabricating industry, is off and running on its most gigantic task, in history: To replace America's worn out plant and build additional facilities needed to produce the goods and services that the nation's health and growth require.

Industry, government and individuals will probably spend a record $75.5 billion for new construction, maintenance and repair in 1960. This is $2.7 billion or 3.7% more than last year's record. New construction put in place will account for $55.3 billion, according to US government estimates based on past contract awards, sample surveys of housing and spending reports from federal, state and local agencies. The balance of $20.2 billion will go for maintenance and repairs on existing construction of all types, according to ENR's projection of government estimates for previous years.

But most important to the construction industry—contractors, engineers, architects and suppliers of materials and equipment—is the outlook for new business. Heavy construction contractors start off the new decade with a record $21.9 billion of contract awards in prospect for the first year. And 1961 should bring another substantial rise to a new high of $22.7 billion, ENR forecasts. These totals include heavy construction in the 50 states and the District of Columbia.

The two-year rise will lift 1961 new business 11% above '59 and about 5% above 1956's record which didn't include Alaska or Hawaii.

Though the construction industry starts off the new decade with annual contracts better than 60% above 1950, nearly all of this is a paper gain representing the relentless rise in construction costs. If cost inflation proceeds unabated, the construction industry will be unable to catch up with the growing needs of America with the money that will be available during the 1960's. Growth in annual volume of contracts during the Sixties when measured in constant prices, or "physical" volume, would be closer to the creeping 4% net gain between the years 1950 and 1959.

The heavy construction market's growth rate in the Sixties will depend not only on need but on availability of new capital. Needs are clearly growing faster than capital. ENR's Backlog of Proposed Heavy Construction in the planning stage has climbed to a record $118 billion (chart at left). This is two and one-half times the amount proposed at the beginning of the last decade. It would take nearly six years at the 1959 rate of contracts to work off this backlog of demonstrated construction needs. However, more needs would be added in the meantime—at least $20 billion per year—so chances of catching up with our construction needs in the Sixties are nil.

But the gap can be closed somewhat if enough capital becomes available and if cost inflation slows markedly. Both are possible in the 1960's.

Planning Ahead: $118* Billion on the Drawing Board

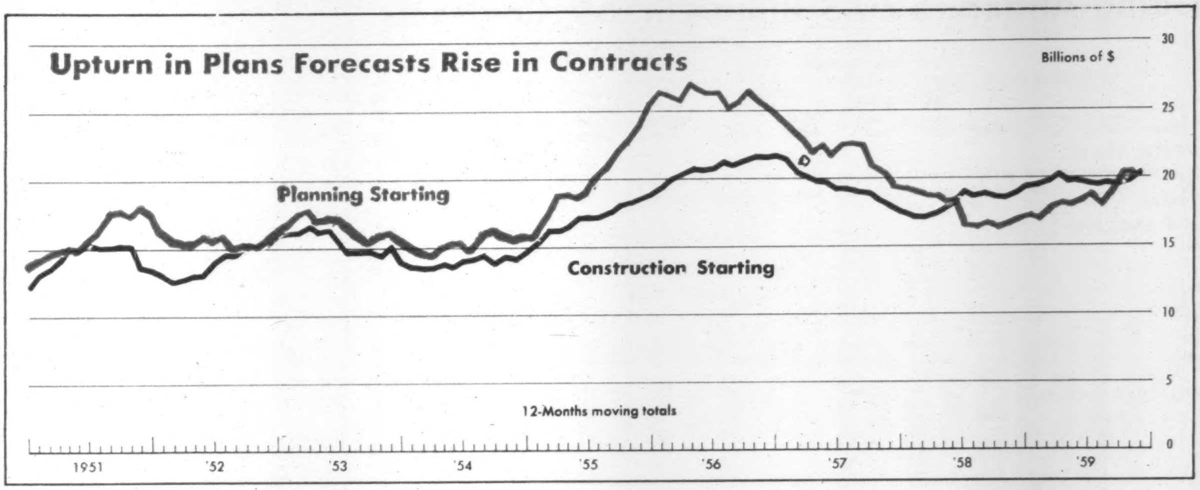
ENR Backlog of Proposed Heavy Construction in the Planning Stage, Dec. 31,1959 * 50 states

Summary of projects on file with ENGINEERING NEWS-RECORD covering proposed construction estimated to cost these minimum amounts or more: waterworks, excavation and irrigation, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, public and private, $400,000.

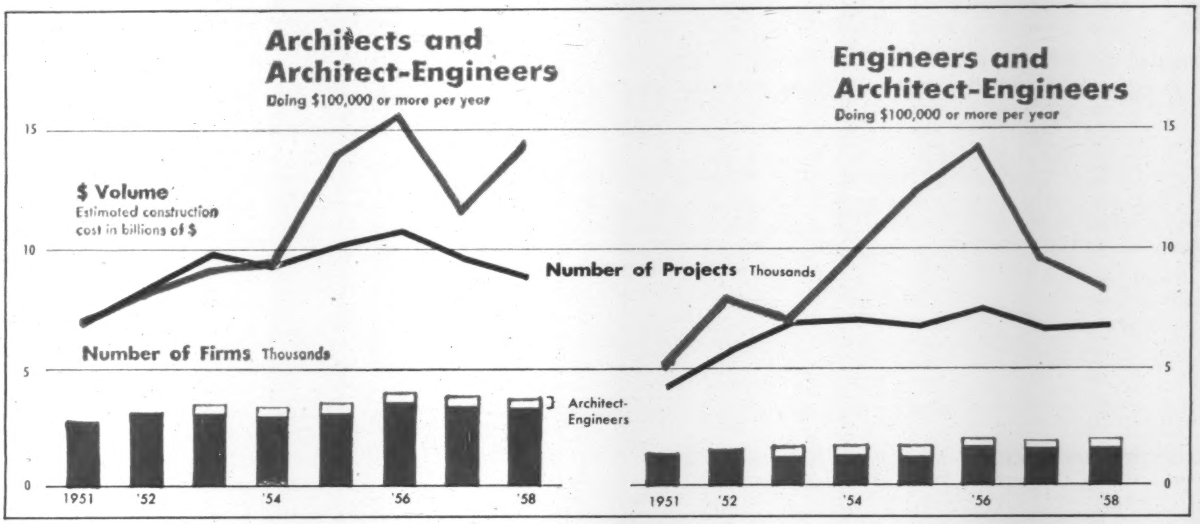
New projects proposed during 1959................(millions) 20,280
Projects moved out of backlog into contracts........ " 10,304
Projects abandoned and removed from backlog (millions) 7,010
Net increase in backlog during 1959.............. " 2,967

Thousands of dollars (000 omitted), December 31, 1959

	Public Works Projects							Federal government work	Private Projects			Construction				
States	Water-works	Sewer-age	Bridges (includes private)	Earth-work irr.-drain.	Streets and roads	Buildings	Unclassi-fied		Industrial buildings	Comm'l buildings	Unclassi-fied	Private	Public	1959 TOTAL	1958 TOTAL	% Change '58-'59
UNITED STATES														**(48 states)**		
1959	**2,822,348**	**3,807,674**	**3,529,369**	**12,068,066**	**12,870,294**	**21,237,804**	**9,852,198**	**14,349,637**	**17,116,829**	**23,261,972**	**10,575,217**	**51,044,721**	**66,097,050**	**117,141,771**	....	+3
1958	2,660,000	3,575,776	3,419,439	11,905,899	12,919,874	20,658,134	9,614,118	14,077,536	17,075,420	22,391,744	9,954,782	49,505,129	64,670,057	....	114,175,186	....
% Change	+6	+6	+3	+1	0	+3	+2	+2	0	+4	+6	+3	+2	**+3**	....	....
NEW ENGLAND																
Me.	543	8,306	11,406	2,719	83,457	72,235	95,029	95,942	27,196	31,196	12,423	70,815	273,695	**344,510**	324,236	+6
N. H.	16,225	15,186	38,880	3,512	4,150	51,978	30,332	34,381	8,617	22,606	11,641	42,864	160,263	**203,127**	191,814	+6
Vt.	2,477	12,408	5,349	96,786	3,994	52,437	2,701	93,646	4,397	14,903	3,038	22,338	176,152	**198,490**	188,414	+5
Mass.	33,722	76,482	137,740	61,803	1,041,515	767,451	215,250	256,147	221,970	655,775	119,993	997,938	2,333,763	**3,331,701**	3,200,483	+4
R. I.	7,120	33,627	48,175	3,768	108,169	108,600	35,031	71,131	57,515	62,286	31,238	164,539	330,990	**495,529**	414,816	+19
Conn.	33,261	127,709	105,927	157,369	211,958	660,116	82,999	143,187	260,155	853,219	107,005	1,223,734	1,379,984	**2,603,718**	2,597,862	0
1959	**93,348**	**273,718**	**348,477**	**325,957**	**1,453,243**	**1,712,817**	**461,342**	**694,434**	**579,850**	**1,642,985**	**285,333**	**2,522,228**	**4,654,847**	**7,177,075**	....	+4
1958	83,911	219,660	304,383	300,825	1,596,866	1,612,268	501,725	677,936	537,552	1,492,157	268,278	2,311,892	4,605,733	....	6,917,625	....
% Change	+11	+25	+14	+8	−9	+6	−8	+2	+8	+10	+6	+9	+1	**+4**	....	....
MIDDLE ATLANTIC																
N. Y.	198,848	316,740	585,947	483,480	1,106,225	3,235,990	1,421,006	460,651	729,199	2,539,491	247,152	3,519,528	7,344,550	**10,864,078**	10,463,927	+4
N. J.	78,320	126,642	203,241	77,792	1,335,690	841,711	337,664	84,558	562,515	1,119,698	178,638	1,862,052	2,999,859	**4,861,911**	4,517,585	+8
Pa.	24,004	162,348	177,968	346,492	1,524,783	1,207,037	439,471	481,024	1,030,694	1,319,951	254,290	2,608,275	3,878,763	**6,487,038**	6,286,530	+3
Md.	70,571	36,281	2,875	60,408	453,405	270,314	214,704	269,207	297,044	329,616	93,505	720,165	1,108,558	**1,828,723**	1,807,257	+1
D. C.	6,968	15,998	65,920	1,998	54,460	332,926	38,559	311,880	2,818	365,500	2,492	370,810	516,829	**887,639**	899,080	−1
Del.	2,027	9,397	19,937	51,114	39,560	55,200	10,998	68,106	42,212	121,760	40,327	211,799	180,733	**392,532**	385,064	+2
1959	**380,738**	**667,406**	**1,055,888**	**1,021,284**	**4,514,123**	**5,943,178**	**2,462,402**	**1,675,426**	**2,664,482**	**5,796,016**	**816,404**	**9,292,629**	**16,029,292**	**25,321,921**	....	+4
1958	364,588	648,325	1,021,027	1,016,549	4,258,408	5,669,932	2,452,560	1,670,909	2,743,584	5,441,970	742,500	8,936,362	15,423,081	....	24,359,443	....
% Change	+4	+3	+3	0	+6	+5	0	0	−3	+7	+10	+4	+4	**+4**	....	....
SOUTH																
Va.	34,296	74,704	49,747	125,940	142,155	355,819	113,876	318,443	272,433	404,906	116,789	796,177	894,608	**1,690,785**	1,460,102	+16
W. Va.	5,660	38,509	11,181	47,123	116,325	97,975	43,898	82,085	232,875	46,940	22,940	302,830	360,596	**663,426**	503,156	+32
N. C.	22,727	44,366	16,267	210,335	34,656	209,543	106,875	384,761	219,173	108,919	128,536	456,906	644,491	**1,101,397**	1,011,553	+9
S. C.	31,278	25,407	9,156	135,154	15,455	137,819	93,650	250,690	511,143	118,776	65,612	695,531	447,919	**1,143,450**	864,319	+32
Ga.	25,384	41,376	32,172	101,136	49,280	319,260	84,614	253,954	146,403	199,616	123,468	470,237	652,472	**1,122,709**	1,138,113	−1
Fla.	26,249	107,682	98,592	24,770	277,931	213,355	114,100	126,040	407,707	741,504	196,683	1,346,519	862,054	**2,208,573**	1,887,455	+17
Ala.	11,559	46,194	17,726	120,972	89,695	340,666	96,124	307,963	585,179	136,887	223,339	945,905	722,436	**1,668,341**	1,757,975	−5
Miss.	37,994	12,464	8,510	20,509	6,246	135,716	95,417	113,170	136,325	46,461	283,199	467,925	314,916	**782,841**	738,980	+6
La.	22,883	55,495	53,065	91,042	112,419	147,481	86,434	176,682	579,784	274,046	504,168	1,358,677	568,140	**1,926,817**	1,752,101	+10
Ky.	12,484	51,683	60,577	81,672	21,784	234,485	28,234	220,124	337,493	108,692	174,179	620,364	490,919	**1,111,283**	1,100,095	+1
Tenn.	29,947	53,420	63,159	104,610	38,798	525,385	104,442	369,842	344,026	302,296	207,235	853,657	919,661	**1,773,318**	1,545,164	+15
1959	**260,461**	**551,300**	**423,152**	**1,063,263**	**904,744**	**2,717,504**	**937,664**	**2,603,754**	**3,772,571**	**2,489,133**	**2,048,148**	**8,314,728**	**6,878,212**	**15,192,940**	....	+10
1958	216,053	471,927	397,716	972,009	867,679	2,503,262	947,905	2,496,320	3,664,731	1,902,949	1,814,782	7,387,409	6,371,604	....	13,759,013	....
% Change	+21	+17	+6	+9	+4	+9	+2	+4	+3	+31	+13	+13	+8	**+10**	....	....
MIDDLE WEST																
Ohio	172,920	378,116	186,316	143,902	583,177	1,111,455	244,998	245,845	1,240,919	1,707,796	533,544	3,494,163	2,808,980	**6,303,143**	6,081,542	+4
Ind.	27,092	39,637	89,032	78,874	451,254	360,658	58,503	107,580	870,471	368,273	168,734	1,407,779	1,104,749	**2,512,528**	2,516,984	0
Ill.	125,619	248,515	262,754	273,660	1,404,153	835,466	454,257	310,993	652,510	1,406,408	246,398	2,320,819	3,588,921	**5,909,740**	5,780,836	+2
Wis.	63,488	76,273	55,011	48,050	24,349	330,144	26,717	99,379	145,629	246,222	52,553	444,504	623,932	**1,068,436**	1,164,901	−9
Mich.	171,680	300,410	199,920	121,178	522,881	1,165,652	168,096	265,038	586,089	784,831	225,342	1,595,262	2,649,817	**4,246,079**	4,230,204	0
1959	**560,799**	**1,042,951**	**793,033**	**655,664**	**2,985,814**	**3,803,375**	**952,571**	**1,029,835**	**3,495,618**	**4,513,539**	**1,226,571**	**9,263,527**	**10,776,399**	**20,039,926**	....	+1
1958	552,778	977,050	774,154	609,114	3,093,291	3,799,192	839,051	1,023,843	3,558,423	4,392,295	1,179,119	9,160,165	10,614,302	....	19,774,467	....
% Change	+1	+7	+2	+9	−3	0	+14	+1	−2	+3	+4	+1	+2	**+1**	....	....
MISSISSIPPI TO ROCKIES																
Minn.	31,080	46,508	29,252	11,002	20,352	285,673	63,922	29,932	290,207	280,469	119,480	692,003	485,942	**1,177,945**	1,063,712	+11
Iowa	7,763	25,407	15,760	69,282	59,980	92,127	10,926	74,223	304,977	89,734	158,955	554,846	280,065	**834,911**	1,087,654	−23
Mo.	58,975	76,594	49,527	201,352	315,168	467,260	83,954	346,887	194,258	460,609	304,796	933,643	1,248,850	**2,212,493**	2,194,104	+1
Ark.	20,056	24,820	6,298	264,177	50,099	125,066	52,398	295,229	301,887	112,071	218,896	632,919	542,849	**1,175,768**	1,185,861	−1
N. D.	4,755	5,133	83	156,163	....	21,720	44,857	195,281	10,234	11,660	50,523	72,417	232,711	**305,128**	305,898	0
S. D.	8,433	2,814	1,425	145,321	22,727	25,309	19,989	165,504	6,172	13,214	48,579	67,965	226,018	**293,983**	266,584	+10
Neb.	23,951	30,661	21,919	140,554	21,129	194,085	101,939	203,059	100,728	95,451	87,232	284,864	532,785	**817,649**	805,039	+2
Kan.	20,903	67,350	10,653	247,172	68,550	192,741	94,104	386,591	102,831	93,485	231,887	428,203	701,473	**1,129,676**	1,087,725	+4
Okla.	50,823	33,244	19,096	275,594	145,122	233,018	142,407	431,843	129,434	125,007	221,503	476,433	898,815	**1,375,248**	1,488,222	−8
Tex.	533,264	228,756	114,723	1,208,392	237,139	1,474,618	813,153	1,305,222	2,714,122	2,746,725	1,693,252	7,168,793	4,595,352	**11,764,145**	11,280,832	+4
Mont.	7,924	12,596	67,353	321,646	8,636	91,532	24,315	348,601	51,976	23,417	31,029	106,422	534,003	**640,424**	612,921	+4
Wyo.	5,215	4,358	3,805	203,248	23,888	36,517	23,024	229,841	130,503	15,634	85,609	231,749	390,055	**531,804**	541,314	−2
Colo.	138,791	18,237	13,902	330,375	144,414	271,207	165,794	503,153	96,351	145,711	243,304	483,355	1,082,720	**1,589,086**	1,653,652	−5
N. M.	13,746	13,160	1,397	54,095	3.235	96,419	86,055	152,944	153,498	100,833	272,941	527,322	268,057	**795,379**	723,371	+10
1959	**925,679**	**589,638**	**355,193**	**3,628,373**	**1,120,439**	**3,607,292**	**1,726,837**	**4,674,310**	**4,587,181**	**4,315,021**	**3,767,986**	**12,693,945**	**11,929,694**	**24,623,639**	....	+1
1958	816,925	586,706	380,163	3,470,027	1,331,444	3,502,275	1,754,380	4,524,549	4,565,352	4,244,593	3,645,024	12,478,684	11,808,205	....	24,296,889	....
% Change	+13	0	−7	+5	−16	+3	−2	+3	0	+2	+3	+2	+1	**+1**	....	....
FAR WEST																
Idaho	2,874	7,825	22,728	98,042	99,160	74,399	68,156	207,700	16,568	18,267	548,413	583,748	372,684	**956,432**	943,687	+1
Utah	26,122	34,763	5,605	113,556	33,156	162,010	20,926	125,199	79,790	138,552	179,677	398,019	396,138	**794,157**	722,571	+10
Ariz.	31,075	14,318	2,156	594,022	69,366	56,139	100,225	665,246	181,125	176,054	287,683	644,862	867,301	**1,512,163**	1,394,122	+8
Nev.	8,918	2,037	4,304	35,892	....	41,998	14,316	28,491	9,862	80,307	44,790	134,959	107,465	**242,424**	238,521	+2
Wash.	97,373	119,980	266,571	1,727,632	742,656	756,530	349,722	1,353,887	441,400	437,725	285,349	1,165,581	4,059,357	**5,224,939**	5,625,836	−7
Ore.	5,340	49,586	26,816	260,690	26,617	101,794	23,338	270,162	243,659	72,354	367,274	683,297	494,181	**1,177,478**	1,145,326	+3
Calif.	429,621	454,152	228,446	2,533,691	920,976	2,260,768	2,704,699	1,021,193	1,044,723	3,582,018	719,584	5,347,198	9,531,480	**14,878,678**	14,997,686	−1
1959	**601,323**	**692,661**	**556,626**	**5,363,525**	**1,891,931**	**3,453,638**	**3,281,382**	**3,671,878**	**2,017,127**	**4,505,237**	**2,432,770**	**8,957,664**	**15,828,606**	**24,786,270**	....	−2
1958	625,745	672,108	541,996	5,537,375	1,772,186	3,571,205	3,118,497	3,683,979	2,005,778	4,917,780	2,305,079	9,230,617	15,837,132	....	25,067,749	....
% Change	−4	+2	+3	−3	+7	−3	+5	0	+1	−8	+6	−3	0	**−2**	....	....
ALASKA (not in U S Total)																
1959	**17,692**	**6,819**	**2,274**	**17,401**	**47,892**	**60,634**	**67,312**	**157,221**	**34,081**	**73,503**	**42,191**	**149,775**	**220,024**	**369,799**	....	+21
1958	18,569	6,267	1,959	19,972	46,140	64,389	48,438	152,646	33,831	48,503	18,569	100,903	205,734	....	306,637	....
% Change	−5	+9	+16	−13	+4	−6	+38	+3	+1	+52	+127	+48	+7	**+21**	....	....
HAWAII (not in U S Total)																
1959	**4,138**	**5,400**	....	**5,979**	**41,351**	**44,894**	**46,056**	**5,455**	**12,450**	**644,184**	**2,938**	**659,572**	**147,818**	**807,390**	....	....
CANADA																
1959	**203,399**	**284,575**	**274,878**	**832,758**	**1,108,769**	**2,275,299**	**1,419,037**	**946,258**	**2,675,089**	**2,512,974**	**2,223,843**	**7,414,730**	**6,395,891**	**13,810,621**	....	+2
1958	200,558	278,212	237,261	820,531	1,176,233	2,154,875	1,437,242	882,649	2,591,847	2,336,477	2,277,209	7,207,957	6,302,488	....	13,510,445	....
% Change	+2	+2	+16	+1	−6	+6	−1	+7	+3	+8	−2	+3	0	**+2**	....	....



Upturn in Plans Forecasts Rise in Contracts



Architects and Architect-Engineers

Doing $100,000 or more per year

Engineers and Architect-Engineers

Doing $100,000 or more per year

The 6% rise in new heavy construction business last year was perhaps no more important to contractors than the news from architects' and engineers' offices that their new business was rising even faster than contract awards.

Construction projects estimated to cost $20.3 billion poured on the drawing boards, as reported by ENR during '59. This was 22% more than all projects proposed during 1958 and marked the reversal of a two-year downtrend in volume of work entering the planning stage (see chart above). It's this strong upsurge in proposed work which sets the stage for a fast start for the new construction market in the Sixties.

Industrial building sparked the 22% jump in total proposed work as it soared 85% in 1959 to top $3.2 billion. The upturn in plans for new plant construction actually started in the fall of '58, thus presaging the rebound in industrial contract awards early in '59. And while the steel strike caused a slowdown in proposed plants during the summer and early fall, the resumption of steel operations in November triggered a sharp rise in plans. This strong trend will probably continue through the first half of 1960, thus assuring a big year for industrial building designers.

Though commercial building bucked the uptrend in proposed private construction last year with a 7% dip, its $2.7 billion total was second only to 1958's peak. Moreover, the end of the steel strike saw a strong resurgence in proposed commercial building.

Public buildings account for the biggest single chunk of proposed work in '59 with projects estimated to cost $4.2 billion. The 4% increases over '58 is particularly significant because it represents a reversal of a two-year slide.

Highways was the only type of other-than-building construction that poured less work into the planning stage in '59 than '58. Though highway volume was off only 3% to $1.7 billion, it remained far less than the $2.4 to $3.9 billion annual totals in 1955-58.

Proposed earthwork-dams-waterway construction rose to $844 million last year, up 24% over 1958's very low volume. But it was low compared with other recent years—$1.1 billion to $2.4 billion annually during 1954-57.

Waterworks and sewerage scored modest increases of 4% to 5% with $530 million and $773 million, respectively. Missile bases helped to lift proposed public "unclassified" construction by 26% in '59 to $1.5 billion.

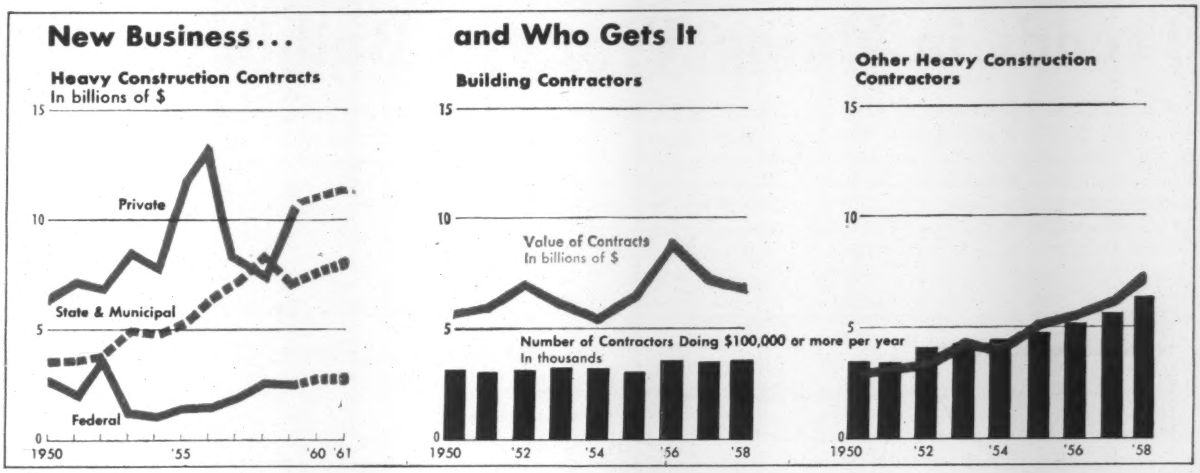
The 22% over-all increase in projects going on the drawing boards last year probably increased the number of architect, engineer and architect-engineer firms doing $100,000 or more in annual new business (based on estimated construction cost of projects reported by (ENR)). Architects will probably show a bigger gain than engineers, however, because most of the '58-'59 gain in new business came in building construction rather than other-than-building types of work.

Going Ahead: $20.3 Billion in '59 Contracts

In Thousands of Dollars (,000 omitted)

	Public Works Contracts									Private Contracts							
						Buildings					Commercial Buildings		Construction				
States	Water-works	Sewer-age	Bridges*	Earth-work irr.-drain	Streets and roads	Resi-dential	Other	Unclassi-fied†	Federal govern-ment work	Industrial buildings	Resi-dential	Other	Private	Public	1959 Total 53 Weeks	1958 Total 52 Weeks	% Change '58-'59
UNITED STATES																	
1959	373,241	653,219	568,923‡	910,830	2,886,921	570,957	2,575,296	1,913,106	2,748,494	2,980,585	4,693,833	2,152,064	10,387,952	9,891,023‡	20,278,975‡	....	+ 6
1958	306,256	617,830	713,422	1,044,648	3,729,217	1,054,904	2,609,571	1,798,511	2,826,041	1,755,973	3,739,213	1,795,089	7,730,182	11,434,452	....	19,164,634	....
% Change	+22	+6	−20	−13	−23	−46	−1	+6	−3	+70	+26	+20	+34	−13	+6	....	....
NEW ENGLAND																	
Me.	433	500	2,595	208	13,085	6,201	9,851	29,778	38,361	19,450	1,615	5,762	26,922	62,556	89,478	119,961	−25
N. H.	69	1,852	1,955	8,149	20,096	....	3,814	5,629	13,188	2,552	5,081	15,306	23,114	41,389	64,503	73,690	−12
Vt.	......	2,639	1,116	510	28,143	....	....	1,222	1,732	436	459	6,260	7,155	33,630	40,785	46,060	−11
Mass.	22,942	11,478	4,168	6,136	74,625	12,975	85,102	53,237	21,570	35,549	132,855	63,898	237,843	265,122	502,965	536,237	− 6
R. I.	870	2,377	864	....	4,106	....	4,691	5,827	5,060	5,858	5,718	11,548	23,124	18,735	41,859	53,914	−22
Conn.	3,117	11,034	4,718	2,996	54,045	15,864	37,441	9,907	15,460	37,771	268,963	84,994	397,670	133,180	530,850	458,936	+16
1959	27,431	29,880	15,416	17,999	194,100	35,040	140,899	105,600	95,371	101,616	414,691	187,768	715,828	554,612	1,270,440	....	− 1
1958	14,132	36,204	22,851	39,311	214,958	66,479	163,673	125,424	176,685	152,787	313,594	139,375	615,476	673,312	....	1,288,788	....
% Change	+94	−17	−33	−54	−10	−47	−14	−16	−46	−33	+32	+35	+16	−18	−1	....	....
MIDDLE ATLANTIC																	
N. Y.	19,772	71,267	33,409	45,762	235,139	67,448	171,408	100,105	34,364	121,821	688,117	364,630	1,199,358	719,520	1,918,878	2,114,220	− 9
N. J.	7,285	16,033	20,275	14,552	53,657	31,841	61,942	13,065	43,322	107,259	532,279	92,266	734,128	216,326	950,454	1,215,086	−22
Pa.	7,966	35,682	12,244	14,281	75,849	16,347	103,427	30,106	27,857	150,692	321,996	76,362	553,562	292,390	845,952	910,193	− 7
Md.	13,678	12,004	9,225	464	36,593	927	101,880	38,320	82,011	51,288	50,100	59,080	161,433	212,126	373,559	280,879	+33
D. C.	601	3,147	9,747	409	15,109	451	56,305	1,766	53,767	2,935	23,552	52,143	79,130	87,035	166,165	153,447	+ 8
Del.	1,362	1,337	4,087	191	4,820	....	13,386	4,597	2,753	39,333	45,452	12,300	98,008	28,857	126,865	102,728	+23
1959	50,664	140,470	88,987	75,659	421,167	117,014	508,348	187,959	244,074	473,328	1,661,496	656,781	2,825,619	1,556,254	4,381,873	....	− 8
1958	40,981	151,140	146,580	408,480	628,870	262,468	565,419	269,741	320,125	293,910	1,437,069	571,895	2,392,450	2,384,103	....	4,776,553	....
% Change	+24	−7	−39	−81	−33	−55	−10	−30	−24	+61	+16	+15	+18	−35	−8	....	....
SOUTH																	
Va.	2,113	5,344	10,143‡	1,589	36,606	12,082	87,569	35,367	100,271	42,577	34,851	28,355	106,853	189,733‡	296,586	236,821	+25
W. Va.	......	12,970	9,415	13,851	33,742	....	23,286	1,626	17,048	20,435	4,000	3,502	28,182	94,645	122,827	148,415	−17
N. C.	7,849	15,983	8,158	2,610	59,710	19,230	25,147	11,169	29,199	146,818	36,838	49,183	235,123	147,572	382,695	198,159	+93
S. C.	6,494	3,239	14,385	1,816	42,830	3,566	12,602	9,394	12,091	154,946	33,773	18,190	209,577	91,658	301,235	160,485	+88
Ga.	3,799	13,593	11,575	5,577	62,154	15,348	26,577	40,479	28,895	104,916	65,464	70,496	258,341	161,637	419,978	242,718	+73
Fla.	6,767	31,295	12,815	11,591	117,367	16,343	53,927	96,002	80,665	85,565	124,252	31,960	262,818	325,066	587,884	451,379	+30
Ala.	21,808	11,998	11,687	9,661	61,046	28,193	80,218	12,536	91,310	10,904	36,535	9,823	62,965	231,444	294,409	328,418	−10
Miss.	631	4,307	14,322	6,588	34,498	6,088	28,844	21,441	34,120	6,789	2,545	4,105	21,008	109,150	130,158	128,714	+ 1
La.	7,796	8,916	8,316	38,855	80,086	8,263	40,187	38,587	62,249	80,411	6,794	21,814	126,940	213,085	340,025	363,674	− 7
Ky.	5,218	11,217	2,436	35,394	78,625	7,460	63,311	12,067	76,933	41,641	18,401	20,304	88,139	207,935	296,074	264,028	+12
Tenn.	3,785	8,882	7,881	4,792	51,392	8,783	117,324	55,722	102,397	121,843	12,895	27,482	202,501	218,280	420,781	210,125	+100
1959	66,260	127,744	111,133‡	132,324	658,056	125,356	558,992	334,390	635,178	816,845	376,338	285,214	1,602,447	1,990,205‡	3,592,652‡	....	+31
1958	49,211	74,920	115,889	142,424	762,595	194,987	390,721	337,620	621,217	301,720	200,617	162,322	739,317	1,993,619	....	2,732,936	....
% Change	+35	+71	−4	−7	−14	−36	+43	−1	+2	+171	+88	+76	+117	0	+31	....	....
MIDDLE WEST																	
Ohio	10,833	34,038	5,118	28,662	110,414	15,163	106,730	46,290	85,303	235,393	465,907	83,827	802,048	340,327	1,142,375	1,186,972	− 4
Ind.	2,060	20,940	26,161	13,433	51,244	8,540	89,665	27,419	30,929	137,842	17,935	24,494	199,517	220,216	419,733	338,130	+24
Ill.	19,898	69,280	77,518	9,584	166,573	20,037	138,317	99,605	62,070	175,446	207,633	125,347	561,771	547,467	1,109,238	1,044,636	+ 6
Wis.	10,095	16,059	16,190	811	62,159	14,941	45,205	23,891	33,729	86,083	11,714	22,026	121,960	187,214	309,174	289,940	+ 7
Mich.	808	9,567	11,303	9,818	121,337	31,074	18,471	34,485	76,335	193,801	43,575	51,789	291,582	234,446	526,028	598,017	−12
1959	43,694	149,884	136,290	62,308	511,727	89,755	398,388	231,690	288,366	828,565	746,764	307,483	1,976,878	1,529,670	3,506,548	....	+ 1
1958	49,225	153,266	172,407	43,411	784,581	80,487	421,928	286,463	292,883	364,428	734,102	367,397	1,541,315	1,916,380	....	3,457,695	....
% Change	−11	−2	−21	+44	−35	+12	−6	−19	−2	+127	+2	−16	+31	−20	+1	....	....
MISSISSIPPI TO ROCKIES																	
Minn.	8,037	21,089	15,100	13,469	65,091	2,731	48,117	63,656	26,818	55,768	23,832	46,904	173,597	190,197	363,794	346,607	+ 5
Iowa	1,997	6,849	20,689	9,978	78,496	....	24,100	10,014	17,858	11,617	4,719	13,243	33,418	148,182	181,600	204,718	−11
Mo.	8,037	8,932	21,327	8,983	54,781	29,217	50,430	67,800	43,059	32,185	53,213	52,841	192,815	194,931	387,746	446,505	−13
Ark.	3,562	4,771	13,655	39,582	30,896	728	16,265	15,049	50,432	13,060	2,911	6,880	33,255	114,104	147,359	178,025	−17
N. D.	514	185	3,871	7,635	37,839	10,079	520	10,790	27,460	1,410	....	1,211	4,235	69,819	74,054	92,595	−20
S. D.	311	381	4,620	54,082	36,016	5,744	4,625	44,698	103,708	40,725	512	1,428	47,725	145,417	193,142	106,486	+81
Neb.	221	4,134	8,330	10,033	27,494	4,255	42,126	32,807	40,034	4,450	1,727	12,973	25,522	123,028	148,550	118,130	+26
Kan.	1,364	5,241	13,500	12,759	37,667	11,098	21,450	34,564	51,460	23,124	7,528	10,604	50,893	128,006	178,899	197,833	−10
Okla.	6,626	3,687	10,412	38,964	31,130	7,898	22,175	21,197	62,707	24,542	9,987	10,828	54,522	132,924	187,446	252,590	−26
Tex.	35,400	31,786	19,435	34,842	285,219	21,131	106,577	179,787	89,456	252,391	612,121	176,089	1,161,866	592,912	1,754,778	1,393,644	+26
Mont.	913	1,030	2,365	3,038	19,446	13,387	4,491	18,013	33,262	2,850	475	10,704	17,224	59,488	76,712	108,457	−29
Wyo.	182	1,897	2,896	5,065	11,701	2,512	12,374	48,033	60,662	7,107	....	993	8,929	83,831	92,760	78,633	+18
Colo.	7,844	2,031	4,571	10,566	31,970	465	28,116	131,549	143,405	15,412	73,047	53,784	145,041	214,314	359,355	256,503	+40
N. M.	104	......	98	9,834	22,602	6,771	25,708	14,797	54,729	18,110	....	488	20,721	77,891	98,612	140,839	−30
1959	75,112	92,013	140,867	258,830	770,348	116,016	407,074	692,754	805,050	502,751	790,072	398,970	1,969,763	2,275,044	4,244,807	....	+8
1958	71,040	109,923	182,304	211,092	876,650	266,663	468,240	441,947	789,343	390,881	598,827	303,998	1,448,415	2,473,150	....	3,921,565	....
% Change	+6	−16	−23	+23	−12	−56	−13	+57	+2	+29	+32	+31	+36	−8	+8	....	....
FAR WEST																	
Idaho	268	5,114	2,483	704	20,967	....	11,571	3,566	16,234	14,903	....	3,075	18,766	43,885	62,651	73,484	−15
Utah	2,433	1,721	2,720	11,656	24,102	2,893	14,073	8,801	16,161	6,680	4,000	13,438	25,267	67,250	92,517	161,241	−43
Ariz.	8,754	3,791	1,741	5,733	39,119	617	20,542	14,974	34,979	2,090	74,600	11,215	89,617	93,559	183,176	191,290	− 4
Nev.	......	......	......	3,464	7,643	904	1,978	10,426	14,379	....	2,300	....	2,300	24,415	26,715	44,992	−41
Wash.	23,539	13,523	20,411	163,187	32,900	29,055	143,263	103,270	288,446	35,752	48,078	28,706	116,340	525,344	641,684	383,166	+67
Ore.	4,435	4,678	12,319	49,284	27,573	2,161	12,235	17,347	65,649	18,233	10,038	3,551	31,972	129,882	161,854	204,065	−21
Calif.	70,651	84,401	36,556	129,682	179,219	52,146	357,933	202,329	244,607	179,822	565,456	255,863	1,013,155	1,100,903	2,114,058	1,928,909	+10
1959	110,080	113,229	76,230	363,710	331,523	87,776	561,595	360,713	680,455	257,480	704,472	315,848	1,297,417	1,985,238	3,282,655	....	+10
1958	81,667	92,377	73,391	199,930	461,563	183,910	599,590	337,316	625,788	252,247	455,004	250,102	993,209	1,993,888	....	2,987,097	....
% Change	+35	+23	+4	+82	−28	−52	−6	+7	+9	+2	+55	+26	+31	0	+10	....	....
ALASKA (not in U S Total)																	
1959	1,421	1,273	475	2,816	6,402	6,890	22,424	37,972	63,290	500	4,000	2,997	12,067	75,103	87,170	....	− 3
1958	1,124	17	2,267	3,855	8,665	6,435	22,047	44,177	78,077	329	1,200	....	5,614	84,502	....	90,116	....
% Change	+26	+7,388	−79	−27	−26	+7	+2	−14	−19	+52	+233	....	+115	−11	−3	....	....
HAWAII (not in U S Total)																	
1959	1,120	704	942	1,171	5,568	12,765	6,224	7,215	19,895	12,233	2,850	5,571	21,177	35,186	56,363	....	−44
1958	......	......	......	......	....	48,896	1,200	....	48,896	41,700	6,650	1,450	49,800	50,096	....	99,896	....
% Change	......	......	......	......	....	−74	+419	....	−59	−71	−57	+284	−57	−30	−44	....	....
CANADA																	
1959	22,429	47,884	75,615	40,204	201,179	32,172	204,683	196,417	209,641	242,574	179,996	236,205	719,507	759,851	1,479,358	....	− 5
1958	27,177	52,632	57,340	28,274	154,614	62,730	218,505	176,321	211,017	260,618	245,778	273,202	880,359	696,832	....	1,557,191	....
% Change	−17	−9	+32	+42	+30	−49	−6	+11	−1	−7	−27	−14	−18	+9	−5	....	....

* Incl. private; Bridges, public $556,570‡ ('59) $702,737 ('58); private $12,353 ('59) $10,685 ('58) † Unclassified, public $1,363,989 ('59) $1,369,289 ('58); private $659,117 ('59) $429,222 ('58)
‡ Does not include $126 million Chesapeake Bay Bridge-Tunnel contract which has been removed from these statistics until the bonds are sold.



New Business . . . and Who Gets It

Heavy Construction Contracts

Building Contractors

Other Heavy Construction Contractors

Private construction in '59 regained its lead over public works as the biggest source of contractors' new business. And because private projects are building up much faster than the public works in the planning stage, private construction will continue to set the pace in '60 and '61. But public works will also rise (see chart above).

The growth rate of contractors' new business in the future in terms of real, not inflated-dollar volume, will depend mainly on these two factors:

- **How successful contractors are in whipping the cost push.**
- **The amount of new capital available** to finance new construction.

Chances are good that labor rate increases will diminish, more progress will come in eliminating wasteful labor practices, materials will be more readily available and prices much more stable in the decade ahead. These developments plus a continued rapid mechanization of the industry would make it easier for contractors to offset wage and price increases with increased efficiency.

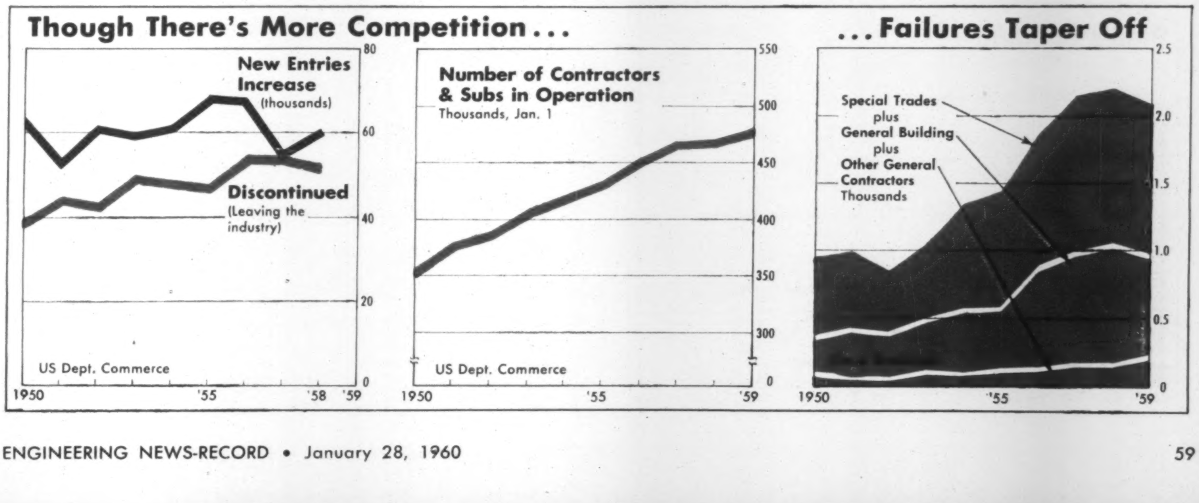
Greater supplies of new capital will depend on more savings by individuals and business. Americans stepped up their savings during 1956-59 without increasing the percentage of total disposable income saved. And a healthy rise in prospect for incomes in the 1960's indicates that individuals' annual savings will keep growing. Depreciation reserves, industry's main source of plant construction funds, are rising. The rate of increase, 14% between '59 and '62, will probably accelerate during 1963-69, according to estimates by the McGraw-Hill Economics Department.

While new business will climb, competition for new work will be just as sharp in the next two years as in the last two. This is because contractors' capacity increased so much more than new businesss in the last decade.

There were a record 474,900 contractors and trade subs in operation in January '59, the U.S. Department of Commerce estimates. During 1951-59, the contracting industry added an average of 10,000 firms per year. The 26% increase since '51 is more than double the all-industry average and tops all other major industries.

Even faster growth shows up in the ranks of heavy construction contractors signing up $100,000 or more annually in new contracts. In the seven years between '51 and '58, their number swelled 49% to a record 10,052.

Most of this increase is in heavy construction contractors doing other-than-building projects (chart above). So it's no surprise that competition has sharpened the most for these types of construction, which are mainly public works. Falling bid prices and rising failures (though still a very small percentage of the total number actively bidding) attest to the stiff competitive battle they are waging for new business. Failures among these contractors increased in '59 counter to the downtrend in failures of building contractors and trade subcontractors.

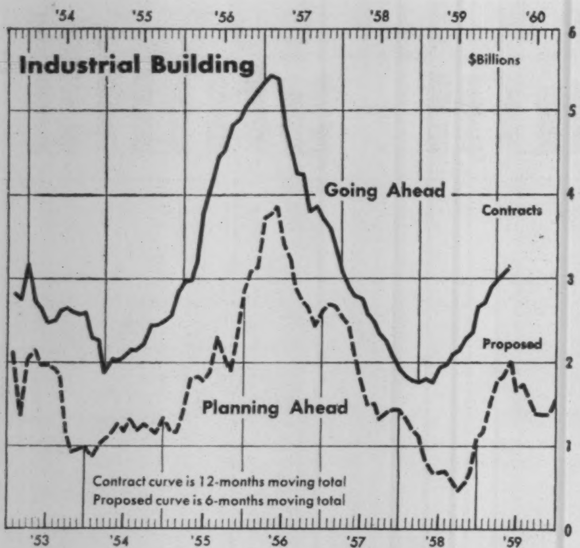


Though There's More Competition . . . . . . Failures Taper Off

Trends in Major Types of Building . . .

Planning for future construction is measured by ENR's Proposed Work series, based on project reports stating type, location, estimated construction cost, owner and designer.

The charts show how this "Planning Ahead" series forecasts contract awards, "Going Ahead." The time scales in the charts are shifted to reflect the lead of "Planning Ahead" over "Going Ahead." Lead times are much shorter for private work than for public. Private projects generally take 18 months or less to pass through the planning stage to construction contract, while about half of public works jobs take up to two years to clear, the other half from two to about six years.

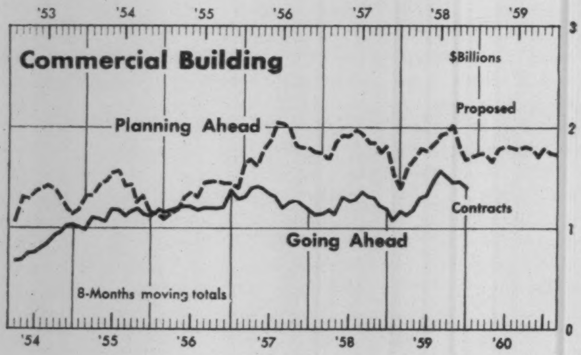


Industrial Building Contracts By Industry

Reported by ENR, in thousands of dollars

Industry	1956 No.	1956 Value	1957 No.	1957 Value	1958 No.	1958 Value	1959 No.	1959 Value
Transportation Service								
Railroad	22	$17,221	14	$9,453	11	$5,359	10	$8,501
Automotive	121	36,528	97	46,586	82	34,081	150	52,816
Public Utilities	150	1,201,312	113	777,700	93	493,267	100	608,329
Process Industries[1]	549	1,785,691	496	1,084,371	332	623,443	516	1,080,129
Food Industries[2]	319	156,033	220	147,974	267	115,050	336	191,294
Metal Refining & Rolling	55	927,117	35	226,126	25	132,656	89	417,663
Metal Working Plants								
Auto	28	288,359	13	52,330	7	12,046	21	55,482
Aircraft	79	161,987	71	75,102	42	22,875	69	43,802
Foundaries	10	7,089	9	1,668	3	848	15	4,518
Mach. & Mach. Parts	537	483,605	435	422,807	253	124,906	347	205,706
Radio, TV & Electronics	25	17,384	40	40,141	30	30,185	66	52,482
Textiles (excl. rayon)	19	7,484	15	3,464	13	3,530	56	31,862
Wood Industries	26	30,809	24	8,958	24	7,870	41	17,006
Miscellaneous								
General Factories	642	212,923	558	183,003	458	147,903	644	208,864
Refrig.& Cold Stor.	4	1,240	7	1,335	9	1,954	8	2,131
Total, priv. financed	**2,586**	**$5,334,782**	**2,147**	**$3,081,018**	**1,649**	**$1,755,973**	**2,468**	**$2,980,585**
Fed. Owned Plants	**135**	**$124,534**	**128**	**$151,648**	**272**	**$299,907**	**260**	**$409,370**

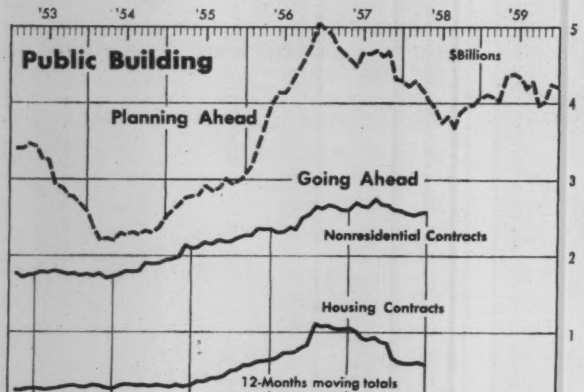
[1] Includes distilleries. [2] Includes breweries, frozen food plants and lockers.

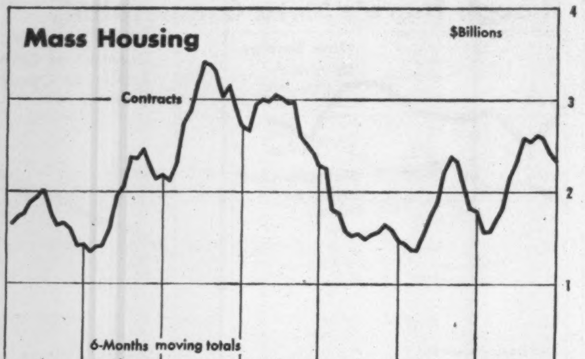


Commercial, Housing & Public Building

Contracts reported by ENR, in millions of dollars

	1954	1955	1956	1957	1958	1959
Private Mass Housing	$4,232	$6,138	$5,307	$3,039	$3,739	$4,694
One-family homes	3,758	5,650	4,812	2,509	3,000	3,433
Apartments	381	364	328	264	450	767
Hotels and motels	46	38	65	157	136	336
Institutional	47	87	102	108	153	157
Commercial Buildings	1,421	1,656	2,051	1,757	1,795	2,152
Public Mass Housing	255	246	318	642	1,055	571
State and municipal	208	184	231	284	434	259
Slum clearance	150	127	119	182	293	161
Other	58	57	112	102	141	98
Federal, military	47	62	87	358	621	312
Public Nonresidential Buildings	1,762	1,741	2,099	2,353	2,610	2,575
State and municipal	1,492	1,343	1,822	1,976	2,053	1,803
Federal	270	398	277	377	557	773
Industrial	183	240	124	152	300	409
Other	87	158	153	225	257	364





. . . And Other-Than-Building

• **Industrial building**—The fourth postwar cycle in industrial building contracts began in early '59, as predicted by the upturn in proposed work late in '58. Every major industry stepped up awards and the number of contracts climbed close to 1956's high.

The renewed upswing in proposed work following resumption of steel operations should continue through at least the first half of '60. So this year's contracts should top $4 billion, including some jobs held off the construction market by the steel strike.

However, the proposed work trend, which leads the contract trend by about nine months, indicates that the contract upturn will fall short of the '56 boom total.

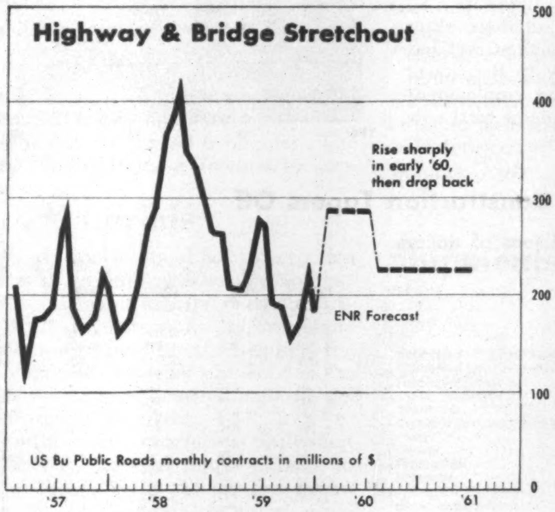
The 1960 trend will reverse itself in '61 if industrial contracts follow their postwar pattern of three-year cycles.

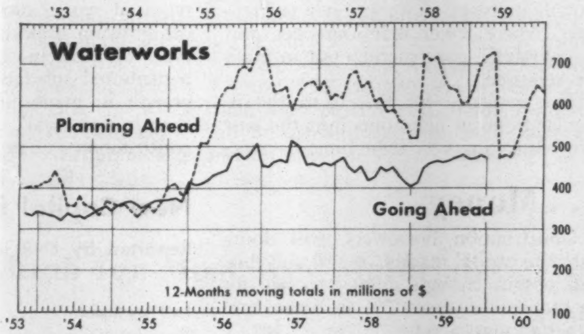
• **Commercial building**—Proposed work points to a record contract volume in 1960 and a further rise in '61—unless money gets "tighter" than anticipated. Proposed commercial building appears to lead contracts by about 14 months.

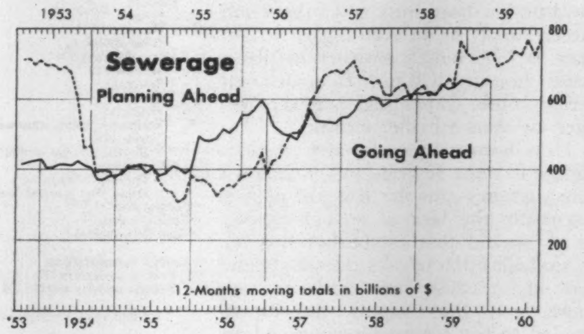
• **Public building**—The 1957-58 slide in proposed buildings caused the 1959 downturn in contracts for public nonresidential and housing. But contracts should turn up by 1961, because the downtrend in proposed work reversed itself late in 1958 and in 1959.

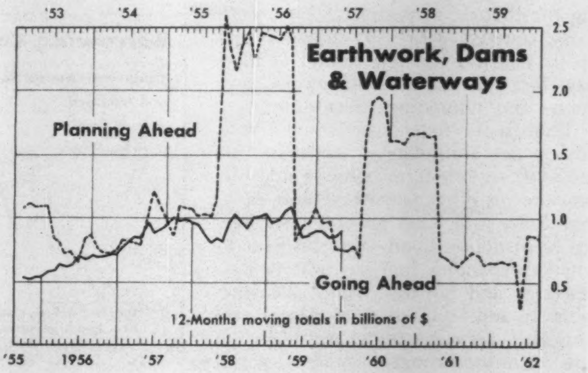
• **Waterworks, sewerage**—New records are ahead for waterworks and sewerage construction in '60 and '61. However, future growth of waterworks and earthwork-dams-waterways depends greatly on the outcome of the November vote on a proposed $1.7-billion bond issue in California, the top waterworks construction state. Right now, chances of passage look dim.

Proposed work is a less accurate predictor of contracts for these three types of construction. Its efficiency is diminished by the fact that large projects are proposed in bulk but go to contracts in sections over an extended period.









Pipelines, Missile Bases Lift "Unclassified"

Contracts reported by ENR, in thousands of dollars

Private	**1955**	**1956**	**1957**	**1958**	**1959**
Transmission Lines	$50,848	$39,862	$32,705	$32,129	$115,673
Pipelines	324,287	261,672	257,379	188,628	216,874
Railroads	47,462	34,497	31,509	5,199	31,636
Telephone	36,507	15,886	16,516	23,646	23,613
Drive-in Theatres	1,730	919	619	200	......
Radio & TV	4,727	8,063	5,639	20,491	3,786
Airports	4,695	13,890	8,868	28,390	16,986
Other[1]	454,316	412,526	146,527	130,539	140,549
Total Private	**924,592**	**787,315**	**499,762**	**429,222**	**549,117**
Public—Federal					
Airports, Airbases[2]	190,150	130,371	184,069	404,121	530,795
Hangars, Buildings	286,943	218,499	212,718	219,182	169,723
Airport Housing	49,676	78,313	53,838	62,167	43,199
Airport Facilities & Util	133,002	142,864	107,653	155,616	98,484
Shipyards	17,822	19,318	18,011	6,703	27,253
Other	135,174	150,166	86,732	147,033	73,585
Total Federal	**812,767**	**739,531**	**663,021**	**994,822**	**943,039**
Public—State & Municipal					
Airports	50,957	97,313	89,788	127,787	157,500
Subways, Tunnels	123,222	82,366	45,011	55,613	86,062
Other	134,540	134,252	176,920	191,067	177,388
Total State & Municipal	**308,719**	**313,931**	**311,719**	**374,467**	**420,950**
Total Public	**1,121,486**	**1,053,462**	**974,740**	**1,369,289**	**1,363,989**
Total Unclassified	**$2,046,078**	**$1,840,777**	**$1,474,502**	**$1,798,511**	**$1,913,106**

[1] Includes private-owned hydro-electric power plants.

[2] Includes missile bases: $121,426 in '58; $354,793 in '59.

Supply Outlook for the Four M's . . .

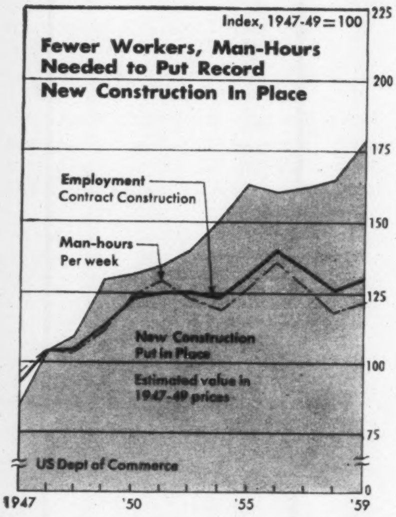
. . . Manpower

Rapid mechanization and more economical construction methods cut labor requirements for erecting new construction during the decade of the Fifties. Between 1949 and '59, the estimated value of new construction put in place climbed 64%, computed by government statisticians in constant prices. However, average weekly manhours worked in the contract construction industry rose only 20%, while average monthly employment increased 26%.

This increase in average output per manhour is due not only to higher productivity, but also to a change in the "mix" of the construction market—rapid growth in types of work, such as highways, where fewer manhours per unit of "physical" construction put in place are required.

The evidence for this is in the irregular trend in manhours over the past two years. Sharpest reductions have occurred in construction "recessions" of '53-'54 and '57-'58. In these periods of plentiful materials and labor, contractors could maintain job schedules with a minimum of overtime, scale crews to the most efficient size and hire better skilled, more productive workers in greater numbers than during periods of booming new business.

But also during these "recessions," housing dropped while other types of heavy construction rose. Though homebuilders streamlined their methods during the Fifties, the relatively small scale of most operations means that manhours per unit of output in this industry are greater than for several other types of work, such as highways. So the growing importance of these other types of work in the total market has contributed substantially to the slower growth in manhours and employment than in "physical" volume of total new construction put in place.


Fewer Workers, Man-Hours Needed to Put Record New Construction In Place

. . . Money

Construction borrowers, will dominate the capital markets in '60 and they will obtain enough money to pay for an increase of about 7% in heavy construction contracts.

But because demand for capital by construction borrowers and others will exceed supply by an even bigger margin than in '59, some construction plans, mainly housing, will have to be deferred because other competing borrowers will offer investors a higher return.

Thus borrowing costs, now at their highest in some 30 years, will hold down construction's growth. But just as it is essentially the lack of enough savings to go around that establishes this lid, so are high interest rates the only sound way of inducing individuals to save more, and thus supply the capital needed to pay for modernizing and expanding the nation's physical plant during the Sixties.

By contrast with '59, industry will up its demand for new capital to help pay for expanding construction programs and rebuilding inventories.

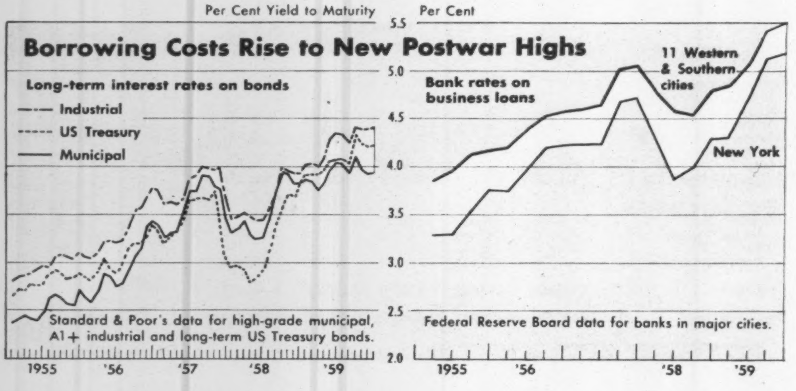
Though the federal government may do less net borrowing in '60 than '59, any shift to long-term bonds would put pressure on other construction borrowers. State and local governments may up construction bond sales this year to finance expanding highway, waterworks, sewerage and possibly school construction. In addition, federal and local construction appropriations are likely to rise with increasing revenues.

New Capital for Construction Tapers Off

Reported by ENR in millions of dollars

	1955	1956	1957	1958	1959	Change '58-'59 %
Total New Capital	$13,057	$14,213	$16,653	$18,190	$17,237	− 5
Corporate Security Sales	3,603	4,727	5,683	5,041	4,165	− 17
State & Municipal	5,008	4,781	5,803	6,370	6,002	− 6
Buildings	2,133	2,000	2,791	2,759	2,509	− 9
Schools	1,694	1,609	2,150	1,940	1,694	− 13
Housing	102	91	185	116	120	+ 3
Other Buildings	337	300	456	703	695	− 1
Heavy Construction	2,875	2,781	3,012	3,611	3,493	− 3
Waterworks	366	396	520	477	540	+ 13
Sewerage	356	426	418	478	424	− 11
Bridges	106	51	70	64	162	+153
Highways	1,261	609	860	986	553	− 44
Earthwork, dams, waterways	95	19	23	424	793	+ 87
Unclassified	691	1,283	1,121	1,182	1,021	− 14
Electric and gas utilities	......	......	239	225	145	− 36
Airports	......	......	135	106	194	+ 83
Parking facilities	......	......	34	25	32	+ 28
Other, incl. general improvements	......	......	713	825	650	− 21
Federal Aid*	854	1,070	2,161	2,596	3,343	+ 29
Federal Loans†	128	159	200	199	140	− 30
Total Non-Federal	9,593	10,737	13,847	14,208	13,650	− 4
Federal Appropriations:						
Federal projects in US	3,380	3,460	2,777	3,946	3,564	− 10
Federal projects outside US	85	16	29	35	22	− 37

* For highways, airports, hospitals. † To rural electric and telephone co-ops.


Borrowing Costs Rise to New Postwar Highs

Standard & Poor's data for high-grade municipal, A1+ industrial and long-term US Treasury bonds.

Federal Reserve Board data for banks in major cities.

. . . Machines

This year is likely to be more of a buyer's market than '59. But it will also be a better year for equipment makers, who will probably rack up their best sales volume since 1956's record.

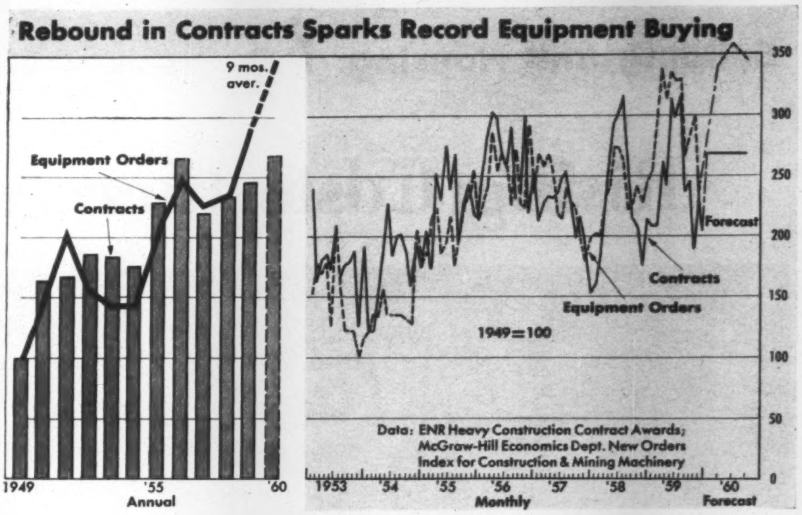
Demand for new equipment rose sharply in '59 as contractors' new business rose for the second consecutive year. In fact, orders rose faster than dollar value of construction contracts. This probably reflected the first heavy buying in two years by contractors who do primarily private construction.

Orders for construction and mining equipment soared 23%. The New Orders Index also topped the '56 high by 16% as it set a record 292, based on 1949 dollar volume as 100. This index is computed by the McGraw-Hill Economics Department from reports by a sample of manufacturers whose major line is construction equipment.

Output in '59 by some 600 equipment makers in the industry declined to $1.8 billion, says the Construction Machinery Division, Business & Defense Services Administration, U. S. Department of Commerce.

The outlook for '60 is brighter. The New Orders Index is forecast to average 229 for the first nine months, up 14% over the '59 period, according to the industry sample. And total output should rise 11% to $2.0 billion, the Commerce Department forecasts.

Four factors noted by the Commerce Department indicate that this year will be more of a buyers' market than last: Inventories of new and used equipment are now higher than usually planned for this time of year; the federal government has large amounts of "surplus" equipment; the industry will be operating at only 67% of capacity, up from 60% in 1959, but less than the 68% in '58 and 85% in the record year '56, when sales peaked at $2.4 billion; and the department sees more numerous auction sales in '59 as a sign of a "depressed market."



. . . Materials

Ready availability of key construction materials in 1960 will enable contractors to maintain high productivity.

With the exception of structural steel, which may be tight during the early months, materials supplies will rise with stepped-up demand and no delivery delays are likely.

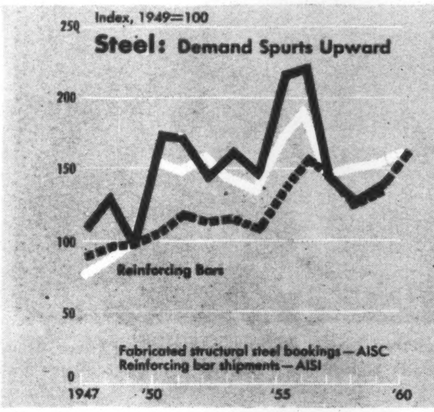
Furthermore, contractors will find nothing in the steel supply outlook to worry them. With the possible exception of the Midwest, balanced warehouse inventories of structurals are expected by April.

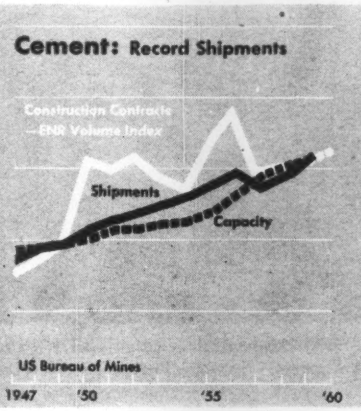
Lumber and plywood are the only major materials likely to be in substantially greater supply than demand, as homebuilders cut back orders.

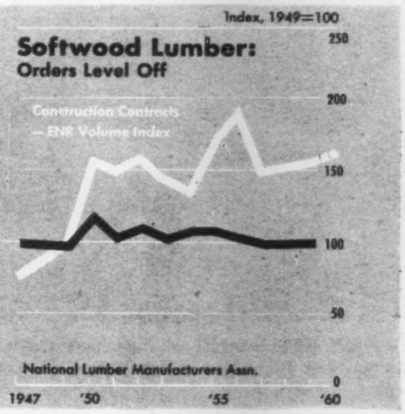
Shipments Climb for Most Key Materials

Material	Source	Unit	1956	1957	1958	1959	% Change 1958-'59
Steel							
Fabricated structural bookings	AISC	thous tons	4,013.2	3,073.2	2,773.4	3,222.9	+16
Fabricated structural shipments	AISC	thous tons	3,205.5	4,179.7	3,664.2	2,904.4	−21
Reinforcing bars (net)	AISI	thous tons	2,517.8	2,286.3	2,034.8	2,161.2*	+ 6
Cement, Portland							
Shipments	Bu Mines	mil bbls	308.8	297.8	307.0	331.2*	+ 8
Concrete pavement awards	PCA	mil sy	84.9	94.0	121.3	95.0	−22
Lumber							
Orders	NLMA	mil fbm.	36,186.0	33,257.0	33,593.0	35,850.0*	+ 7
Production	NLMA	mil fbm	37,528.0	33,572.0	33,579.0	36,787.0*	+10
Shipments	NLMA	mil fbm	36,443.0	33,831.0	33,940.0	36,050.0*	+ 6
Clay construction products							
Brick, unglazed common and face	Bureau	mil std brk	7,381.6	6,305.9	6,458.8	7,384.1*	+14
Structural tile, unglazed	of	thous tons	750.5	640.7	542.9	537.5*	− 1
Vitrified clay sewer pipe	Census	thous tons	2,038.5	1,629.0	1,772.3	1,984.6*	+12
Aluminum wrought products (net)							
Sheet & plate, non heat-treatable	Bureau	mil lbs	1,050.6	944.8	944.4	1,284.4*	+36
Wire and cable	of	mil lbs	303.0	281.6	270.0	321.9*	+19
Extruded shapes, soft alloy	Census	mil lbs	641.0	644.9	692.9	923.4*	+33
Asphalt products							
Roofing	Bu of	thous sqs	57,590.4	53,326.1	58,228.1	62,368.4*	+ 7
Siding	Census	thous sqs	1,208.3	1,035.8	1,040.1	969.1*	− 7

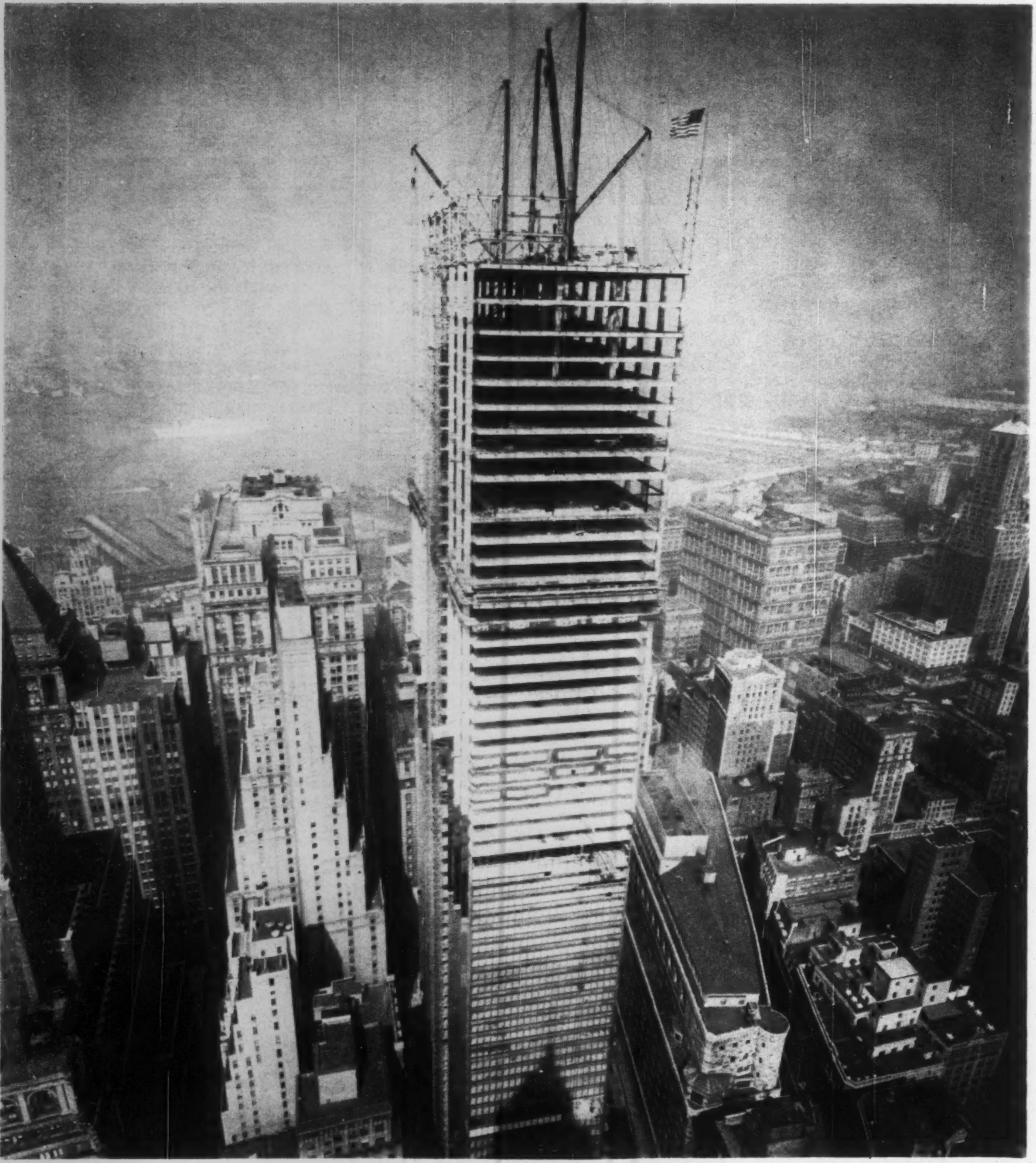
* Estimated







Rising Costs Increase Demands



A NEW BEGINNING in New York City's oldest commercial neighborhood is represented by the 60-story, $130-million Chase Manhattan Bank Building going up in the downtown financial district. The project incorporates high-strength bolting, lightweight floors and metal curtain wall.

on Both Designer and Builder

- **Increased activity in building construction this year and next will bring more opportunities for the designer and builder.**
- **There will also be more competition and higher costs—factors that put a premium on efficiency in design and construction.**
- **1960 will be a good year for designers and builders who plan carefully and use new methods and materials.**

New dollar volume records were set in building construction during 1959. But pressure of rising costs and competition put a squeeze on designers and builders that was reflected in much of the year's building and that will be felt through 1960, too.

The big squeeze is for efficiency—more building for each dollar spent.

For the engineer it means increased emphasis on lighter weight, simpler designs.

For the builder it means still tighter figuring and even more careful construction planning.

And this demand will accompany an increase in construction during 1960 that should continue on into 1961.

Last year, mass housing was the leader with a 26% increase over 1958. Spending for mass housing rose from $3.7 billion to $4.7 billion.

But this trend will be reversed in 1960 with an expected drop of 17%, down to $3.9 billon. Biggest reason for the drop: tight money.

Commercial construction set a new record last year with $2.2 billion of construction in place—an increase of 21% over 1958. This record just tops the previous high of $2.1 billion set in 1956. But 1960 should see a 15% rise over last year to $2.5 billion.

Industrial building will take the biggest part of the building construction dollar in 1960. This area showed a spectacular rise of 70% in 1959 over 1958. But the rise, from $1.7 to $2.9 billion, would have been a danger signal at any lower figure, considering the low rate of industrial building in 1958.

This year should see a 34% increase in industrial construction over 1959. The forecast figure of $4.0 billion compares closely with the $4.1 billion spent in 1951, but doesn't touch the 1956 record of $5.5 billion.

Increased demand for new products and materials plus the drive for higher productivity are the reasons for this year's expected rise in plant construction.

The demand for greater savings in building design has increased the role of plastic design in steel and ultimate strength design in concrete.

Courses on plastic design by the American Institute of Steel Construction in cities across the country have increased designers' and building officials' knowledge of the method. This program, following publication last year of the AISC plastic design manual, has helped promote adoption of plastic design in building codes, too. Design by the plastic theory was adopted by the International Building Officials Conference last fall in their Uniform Building Code.

Largest example of plastic design in steel last year was the Safeway Grocery warehouse center in Omaha, Neb. (ENR April 30, 1959, p. 39).

Ultimate load design in concrete is already recognized by Philadelphia, Kansas City, New Orleans, Dallas, Spokane, Boston and Pittsburgh. As research investigation continues here, acceptance in this country will grow and the method of design will approach the status that it has enjoyed for years in Europe and South America.

Concurrent with research in ultimate load design are investigations in limit design of reinforced concrete. Ultimate load design in concrete, unlike plastic design in steel, applies only to the proportioning of sections to resist internal stress. Limit design promises to supplant the elastic analysis of reinforced concrete frames. This will add to the economies already gained through use of ultimate load theory.

The trend toward precasting concrete members, both reinforced and prestressed, is adding a new dimension to the use of concrete. Precision casting techniques, improved concrete control, and more refined design analysis for mass-produced members have extended the range of structural concrete.

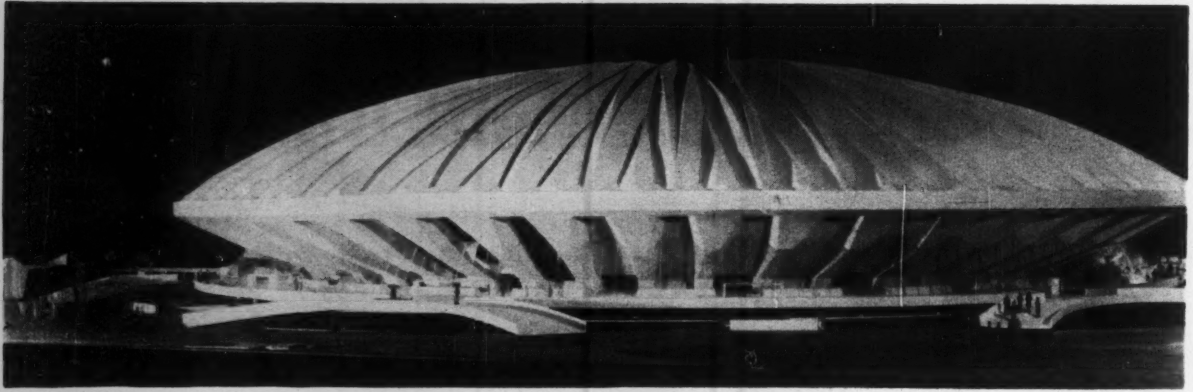
Just as high strength bolting continues to grow in the steel industry, expect an increase in welding of building frames, too.

During the past year, continuous framing in steel received more attention from engineers. Design of an automatic parking garage built in Portland, Ore., reads like a what's-what in steel construction. The steel skeleton employs continuous framing with both high strength bolting and welding for the field connections plus composite design with welded studs between steel floor framing and concrete floor slabs.

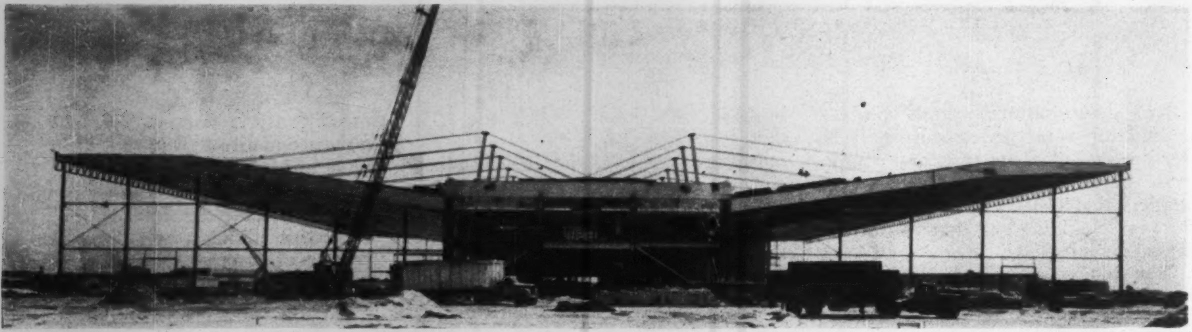
The use of electronic computers as a structural design tool is growing, and engineers are applying these high-speed devices to analysis of multistory building frames. The great potential of computers makes it reasonable to assume that applications to building design will become more and more frequent in the next few years.

Plastics continue to gain a larger share of the building materials market as acceptance of the materials spreads in building codes. Reinforced plastic wall panels will be the major plastic building product for some time. New developments in plastic sealants will contribute to improved performance of curtain wall construction.

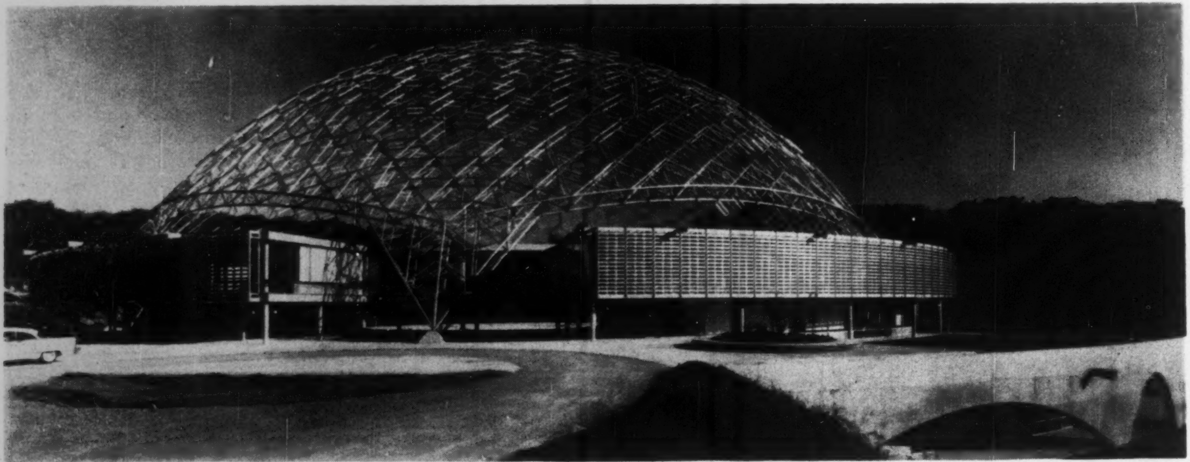
Prefabrication continues to grow in



NEW SHAPES IN CONCRETE, like the dome of the University of Illinois Assembly Hall at Champaign, Ill., are appearing more often. This $7.5-million project will be completed next year.



LONGER REACHES WITH STEEL meet the demand for larger structures with clear floors to house and service the mammoth jet airliners. Hangar #17 at New York's International Airport will go into service this year.



LIGHTER DESIGN WITH ALUMINUM and alloys is strikingly demonstrated by the American Society for Metals headquarters in Novelty, Ohio. The decorative aluminum frame is based on R. Buckminster Fuller's geodesic dome design.

the building construction field. In housing, factory assembly lines are turning out not only wall and roof sections, but also prefabricated plumbing and electrical units. This preassembly, both in factory and field, isn't confined to the housing market, either. A plumbing contractor on a large office building project has prefabricated rough plumbing for all typical floor bathrooms, eliminating a large amount of work previously done on the job.

An aircraft manufacturer has developed a prefabricated building of paper honeycomb-lined aluminum panels for assembly at remote posts by the Army and Air Force. It has no expendable parts, so there's no need for supply depot shipments each time the structure is moved. Inflatable tubes on the perimeter of each panel provide a built-in sealing system for the building.

Another panel building goes together without nuts, bolts or nails. Adhesive tapes hold the entire demountable structure. Panels butt together with tapes between and over both sides of

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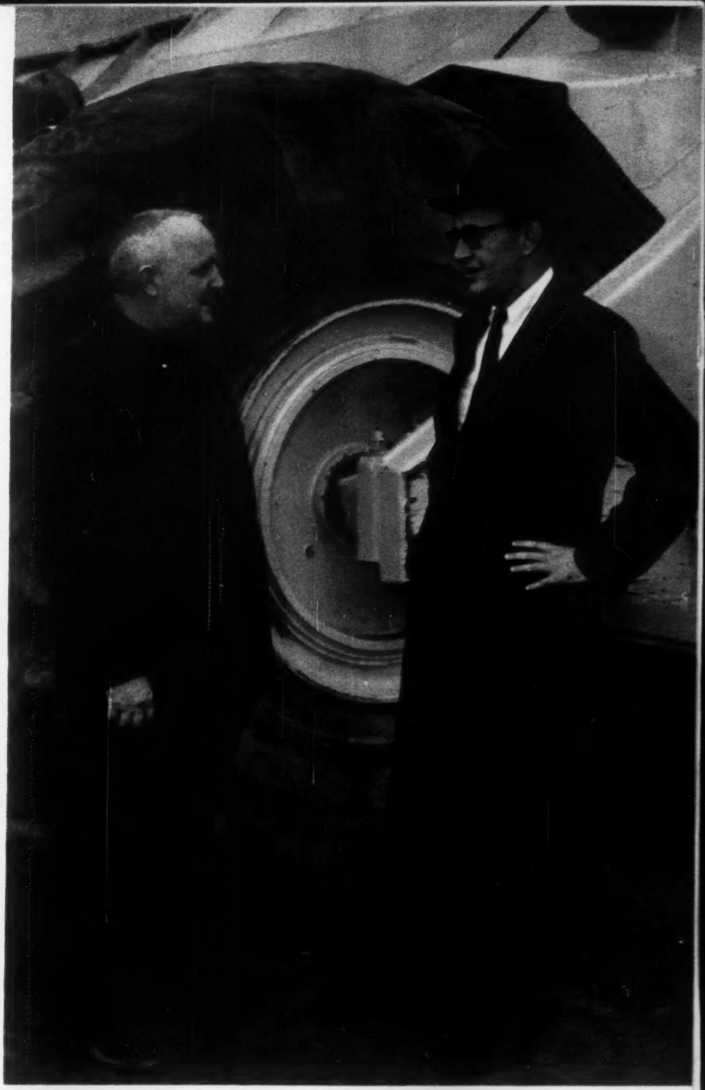
That's the story at C. F. Replogle, Circleville, Ohio. With king-sized MRS scrapers and other heavy equipment—all serviced with Gulf fuels and lubricants—their company earth-moving record is over 100,000 yards a day.

One of Replogle's recent big projects was a 3-mile section of the Cincinnati-Conneaut Thruway near Belleville-Mansfield, Ohio. The contract called for moving some 2,000,000 yards of earth, paving, and constructing 11 bridges. They've already completed the earth-moving, on schedule, in spite of weather delays. According to Charles Thompson, Operations Manager, Gulf fuels, lubricants and on-the-job service had a great deal to do with the fast pace of the entire operation.

"We know our engines run clean on Gulf diesel fuel, because we have no injector or pump trouble," says Mr. Thompson. "This pays off in equipment availability. Our equipment is available over 95% of the time."

Dean Shellhouse, Superintendent of Maintenance for



Gulf man on-the-job checks fuel and lubricant requirements at Replogle project on 3-mile section of Cincinnati-Conneaut Thruway. At right is Robert Williams, Gulf Sales Engineer with Charles Thompson, Operations Manager of C. F. Replogle Construction Company.

a day using Gulf fuels and lubricants . . .

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Replogle, adds: "We use over 3,000,000 gallons of Gulf diesel fuel a year, and have no problems with gum, sludge or sulfur deposits. A first line fuel is not expensive when you consider freedom from breakdowns and resulting costs."

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Scaffolding and Shoring Methods

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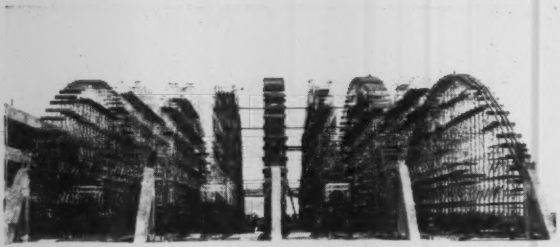
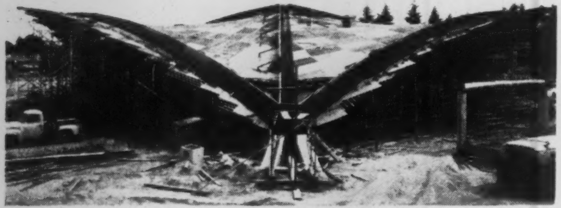
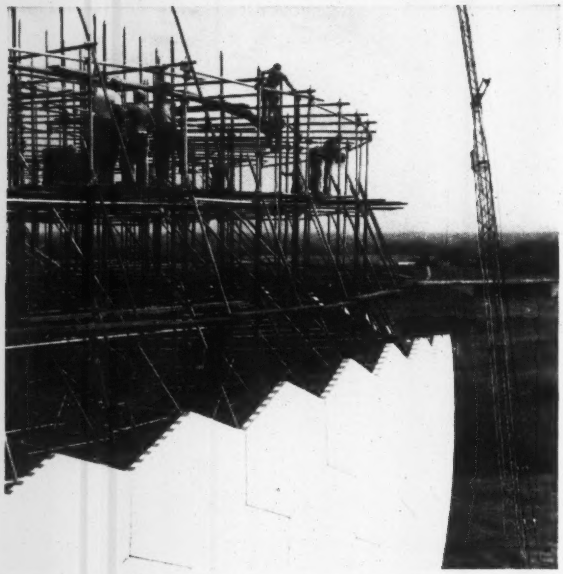


SAME SHORING FOR RIBS AND SLAB — Standard "Trouble Saver" Shoring frames, spaced 3′7″ to 5′ apart, support formwork for new, all-concrete Swissair Hangar #15, Idlewild, N. Y. 5 arched ribs are 180′ long, 28′8″ apart and vary from 2′6″ at arch peak to 4′9″ at base. Slabs are 5″ base to 3″. Walter Kidde Constructors, Inc., contr.

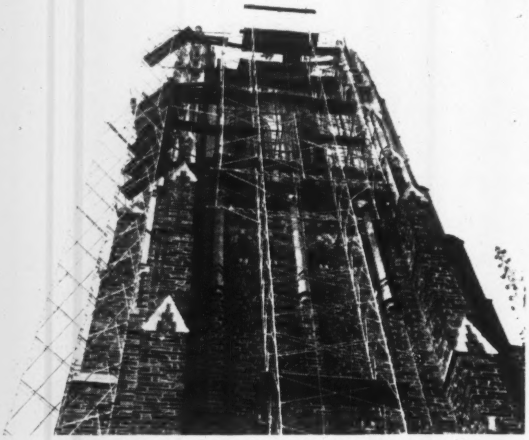
SUPPORT FOR HYPERBOLIC PARABOLOID DESIGN —On the new hyperbolic paraboloid auditorium at Edward S. Ingraham H. S., Seattle, Sound Construction Co., gen. contr., finds standard "Trouble Saver" Sectional Shoring ideal for supporting the arched beams and slabs. In effect, the building is three butterfly roofs tied together to form one complete dome, 35′ high at center point.





24 MILES OF SCAFFOLDING SPEEDS RADOME —A huge bowling-ball shaped structure, 140′ in diameter, is being erected at Moorestown, N. J., atop an Engineering Model Building to house and test a gigantic radar antenna system for the Ballistic Missile Early Warning System. During application of the six-sided plastic panels, 24 miles of "TubeLox" Scaffolding was erected to provide working platforms for the steel erectors, Cornell & Co. Radio Corp. of America, weapons system contractor for BMEWS under direction of the Air Force, is duplicating a part of a BMEWS installation to inspect and check radar gear.

REPEAT PERFORMANCE—PS Co. scaffolded Duke Memorial Chapel, Duke Univ., Durham, N. C., for construction in 1931. For renovation this year, William Muirhead Const. Co., Inc., gen. contr. uses PS Co. "Trouble Saver" Scaffolding built to 205′ high to provide platforms for workmen in anchoring 68 loose stone spires around the bell tower.



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joints to form I-shaped bonds between sections.

The Corp of Engineers has developed a series of standard steel building components for erection of barracks, shops and warehouses. The same purlins, girts, roof sections, doors and windows fit all the structures.

Steel framing is also on the increase in housing. Steel producers are pushing this market hard, particularly in the western part of the country.

As the market for prime office space continued unchanged in New York City, three buildings under construction in 1959 stood out as top examples of the art. These are the 48-story Time-Life Building, the Union Carbide Corp. headquarters, and the 60-story Chase-Manhattan Bank Building. Scheduled to start this year is the 55-story Grand Central City building, which will have 2.5 million sq ft of office space.

More and more building money is going into civic and commercial centers. Several are under way now and more are in the planning stage.

In Boston, foundation work began on the $80-million, 31½-acre Prudential Center. A 52-story tower building will dominate the commercial-civic development.

In Houston, plans were announced for a $100-million development to be named Cullen Center. On the West Coast, work continued on the $350-million Los Angeles Civic Center. In Memphis city officials approved plans for a $32-million civic center in the heart of the downtown area. In New York City, construction began on Philharmonic Hall, first building to go up in the Lincoln Center for the Performing Arts which could cost $100 million.

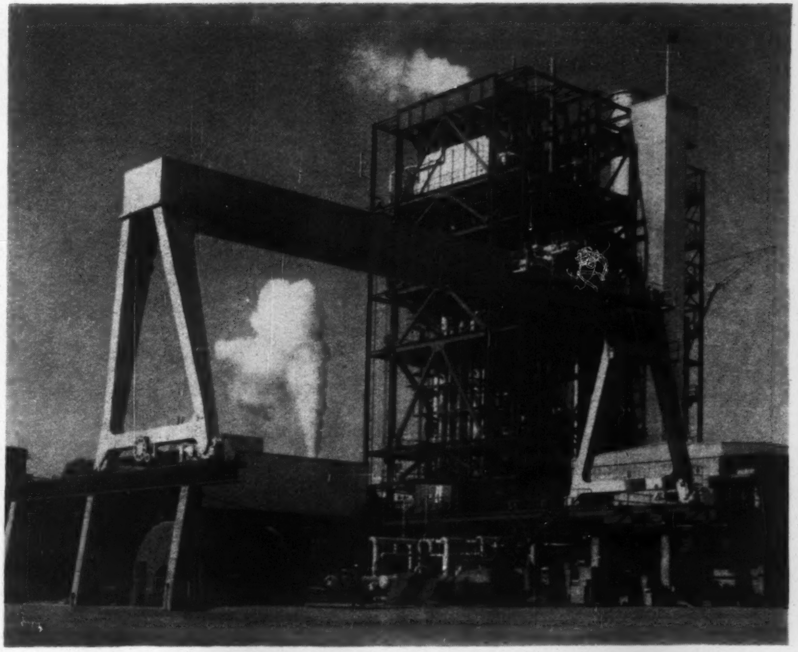
Beyond the actual dollar value of construction involved in these and other building groups, "center" projects are giving impetus to other urban renewal projects in their cities. The outstanding example of what can be accomplished with combined urban renewal, and civic and commercial development is the downtown area of Pittsburgh.

Lightweight designs appeared more often in 1959, in many places and in many forms.

In Sokolniki Park, Moscow, a 200-ft dia aluminum panel and space frame dome dominated the U. S. Exhibition. The entire dome weighed only 52 tons.

Union Tank Car Co. built its second spherical dome repair shop, this one at Wood River, Ill. The structure weighs 500 tons, but spans 380 ft. Its twin was built in Baton Rouge, La., the year before.

Near Cleveland, the American Society for Metals erected a 250-ft dia spherical space frame over its new national headquarters. In this case, the open lattice consists of a double frame of aluminum tubing formed in hexagons 11 ft across and held with the two levels 30 in apart by spreaders.



POWER PLANT construction will increase this year as the industrial building sector expands. This plant, at Yuma, Ariz., is now in service.

Erection was different on all three projects. At Moscow, a central gin pole tower lifted the domework as crews added panels at the perimeter. On the Union Tank job, a nylon bag beneath the dome raised the structure by air pressure as workers assembled panels at ground level around the edge. The ASM frame went up in sections assembled at ground level and hoisted into place by crane.

The fact that none of these domes was erected in the same manner points to both the newness of this building tool and the active thinking that is going on in the building industry concerning the use of these lightweight building forms. Expect greater employment of these structures and a growing variety of construction techniques as builders work to reduce costs.

Builders in Tokyo erected a 400-ft dia steel framed dome as the focal point of permanent quarters for the Tokyo Trade Fair. Computers speeded design of the skewed, trussed frame, since no two triangular sections were exactly the same size. Builders erected the 180-ft-high structure in just 180 working days.

In the arctic, construction for the defensive warning systems has produced buildings that raise themselves and giant radar antennas. For the buildings, special framing provides clear interiors measuring 133 x 144 ft and forms massive column assemblies that allow the buildings to be raised above rising snow levels. For the antennas, frames of tubular nickel steel measure 163 ft high and 400 ft long.

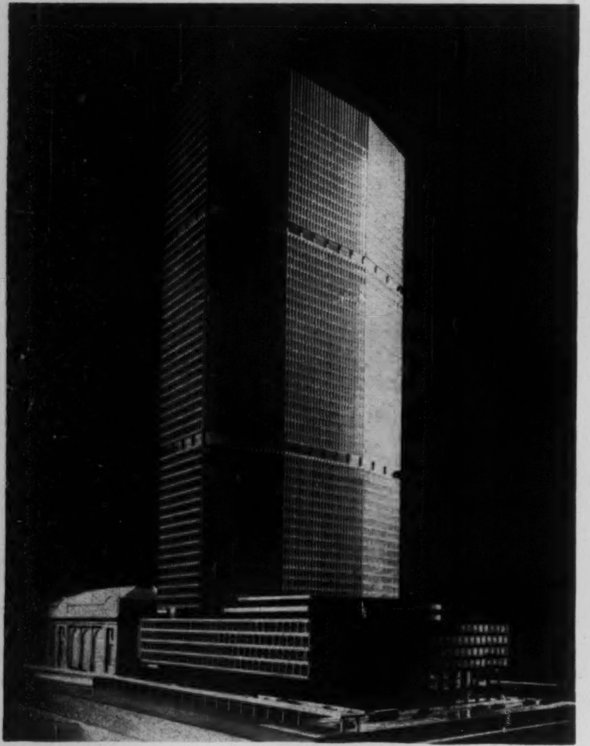
Within the U. S., missile launching base work developed as a new breed of construction.

These things make the work different: much of the construction is underground; mechanical installations are a major part of each missile complex; high levels of precision and cleanliness are demanded in fueling systems. Above all, builders must cope with continuously changing technology, which brings construction changes against unchanging completion deadlines.

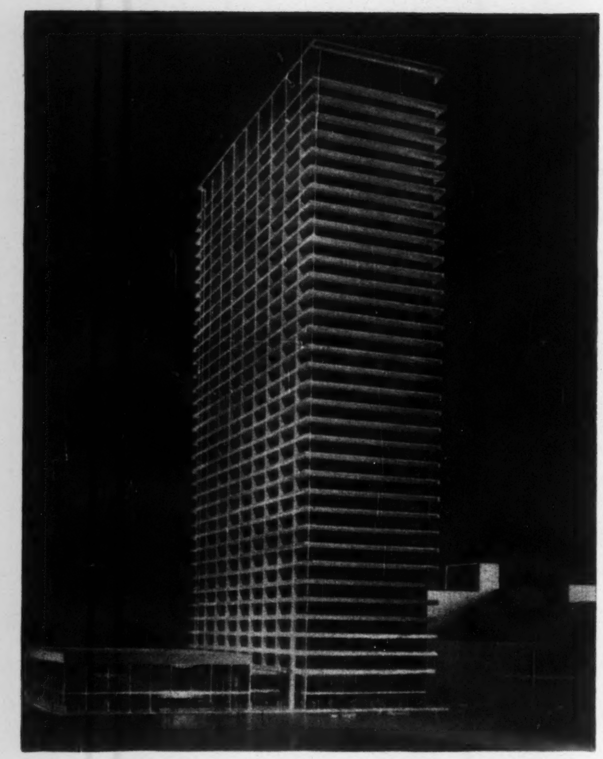
The Frank Lloyd Wright-designed Guggenheim Museum opened in New York City. A critics' battle developed immediately over its merit as a gallery for art, but there was no question that the spiral-shaped, reinforced concrete structure presented a unique problem in construction.

New problems of both design and construction appeared in the field of radio telescopes. At Green Bank, W. Va., work progressed on a 140-ft-dia telescope. At Sugar Grove, W. Va., construction began on the world's largest space prober, a 600-ft dia telescope.

Size, weight and precision of movement require a different design ap-



GRAND CENTRAL CITY, the $100-million New York City project, will be under way by the end of this year.



FIRST NATIONAL CITY BANK will finish this $20-million, 32-story building in Houston.

proach in these structures. Strain rather than stress becomes the dominant design factor.

The 850-ft-dia synchrotron at Brookhaven National Laboratory, Upton, N. Y., called for a similar degree of precision in construction. Exact alignment of giant magnets in the circular tunnel required accurate construction of the reinforced concrete, pile supported foundation.

Demands of economy and size are producing new and varied hangar designs. As large jet aircraft come into service, maintenance and service buildings for them appear from coast to coast. Though no two designs are alike, many depend on some variation of balanced cantilevers extending from a central core structure.

At New York City's International Airport, cable suspended steel box girders cantilever 158 ft to frame the roof of Hangar #17 for the Port of New York Authority.

Trans World Airlines' maintenance hangar at Los Angeles International Airport employs steel truss cantilevers supported on a reinforced concrete core structure.

In San Francisco, United Air Lines completed a service hangar of double cantilever design. In this case, steel plate girders extend 142 ft on either side of a reinforced concrete core structure. Core column sections vary from top to bottom following stress distribution.

The design for United Air Lines' hangar at O'Hare Field in Chicago centers around double steel truss cantilevers prestressed to save in weight, reduce deflections and minimize secondary stresses.

In Atlanta, single cantilever steel truss construction reaches 177 ft to provide a 71,400-sq-ft maintenance hangar for Delta Air Lines. In this case, designers carried the roof structure from an 80-ft-wide, steel-framed shop structure with ties composed of 14WF53 sections with 15 in. channels on the top flanges. In each instance, largest possible clear floor area and economy were the major design considerations.

Light cantilever design appeared in the sports world, too. The Sports coliseum at Squaw Valley, Calif., for the 1960 Winter Olympic Games features a 300-ft span and is actually two separate structures. Two lines of tapered steel box beams cantilever from each side of the building meeting at slip joints on the ridge line. Steel backlegs and masts carry cable suspenders to support the roof framing.

The Pan American Air Lines passenger terminal at New York International Airport features an elliptical roof frame cantilevered 114-ft out from a central core. Passenger services will be within the core area; planes will load and discharge passengers within the overhang of the cable-suspended roof structure.

The Norton Building at Seattle combined steel and concrete framing to satisfy design requirements of maximum flexibility in floor layouts. The object of meeting any possible change in office space requirements over the years produced a design of steel columns and girders with 70-ft-long prestressed concrete beams. Net result is a 70 x 210-ft tower with only two interior columns.

Designers of the Washington Building, also in Seattle, cut costs of the steel frame building by reworking floor and spandrel beams from standard rolled sections to get more effective use of framing weight.

In San Francisco, the Crown Zellerbach building was completed. As with the Norton Building in Seattle, interior flexibility was a prime design consideration. Here, two lines of heavy fabricated columns carry floor framing across 63-ft-wide, column-free tower floors.

The use of hyperbolic paraboloids is increasing.

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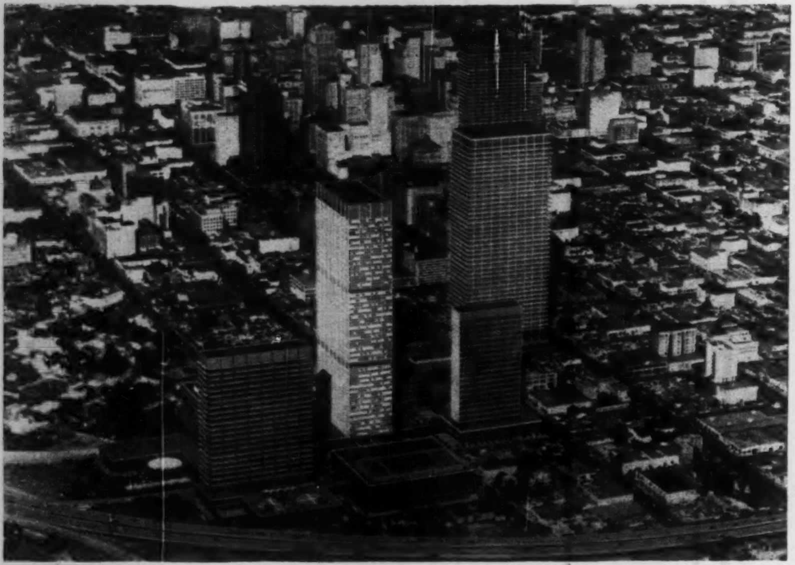
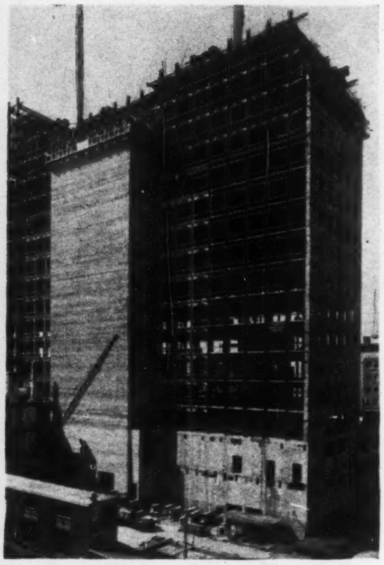
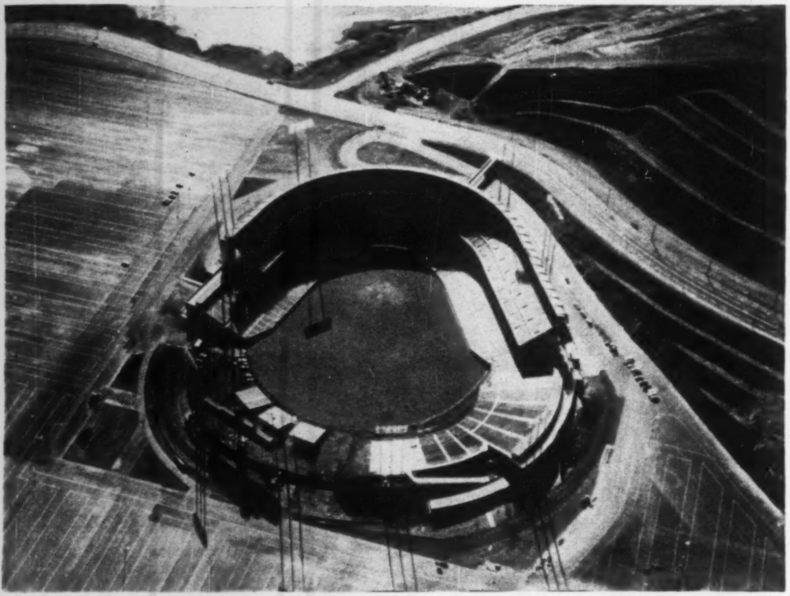


CULLEN CENTER in Houston is one of a number of ambitious "center" projects that will modernize downtown areas of major cities. It will cost $100 million.



NORTON BUILDING in Seattle economized with cut and rewelded framing.



CANDLESTICK PARK was finished in San Francisco. It may be the first of a series of stadium jobs that could come with a third major baseball league.

Near Columbus, Ohio, five concrete H-P sections are going up to cover a 116x300-ft grandstand at Scioto Downs race track. Each shell rests on a single column and is held at an angle by a tension member extending from the rear edge down to the grandstand framing.

Hunter College in New York City, opened a library roofed with six thin concrete H-P shells. In Massena, N. Y., a club house building was covered with a wood H-P roof composed entirely of 2 x 4s glued together on edge. Near Indio, Calif, a steel H-P roof shades a desert home. Stores in St. Paul, a radio station in New Zealand, a swimming pool in Long Island, a shopping center in Florida all have the "umbrella" form in one material or another.

Construction moved ahead on the new Providence, R. I. post office, where six thin shell, concrete barrel vaults will cover the country's first automated post office.

Records were claimed last year in both steel and concrete construction. On the West Coast, builders of the Los Angeles Memorial Sports Arena pointed to deep steel trusses spanning 315 ft across the 22,400-seat building as the longest erected in this country. On the East Coast, precast concrete, three-hinged arches reach 160 ft across a new gymnasium at Fairfield University in Connecticut.

Last year's successes in the building industry were marred by accidents and scattered failures. The steel frame of a one-story factory building gave way in Westbury, N. Y., dropping the roof to ground level and trapping construction workers inside. Additional knee bracing, levelling plates under columns and added spandrels in the new frame underline the need for adequate provision against sidesway—too often ignored in industrial building shell construction.

Responsibility of designing engineers for supervision through the construction stage of a project has been underscored as an essential part of the engineers role and changes in building codes reflect this thinking.

Extensive damage to Ottawa's new air terminal during a jet flyover points up the importance of shock consideration from sonic boom in structural design.

Fire prevention, focused on schools, has produced results. Cities throughout the U. S. have tightened code requirements, and more important, increased fire inspection. An extensive fire test program conducted last year in Los Angeles added much needed information on the effects of smoke and heat in fire control.

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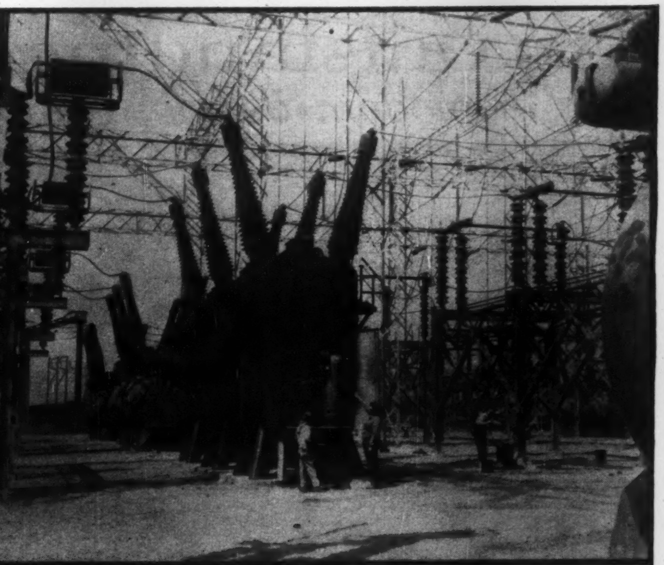

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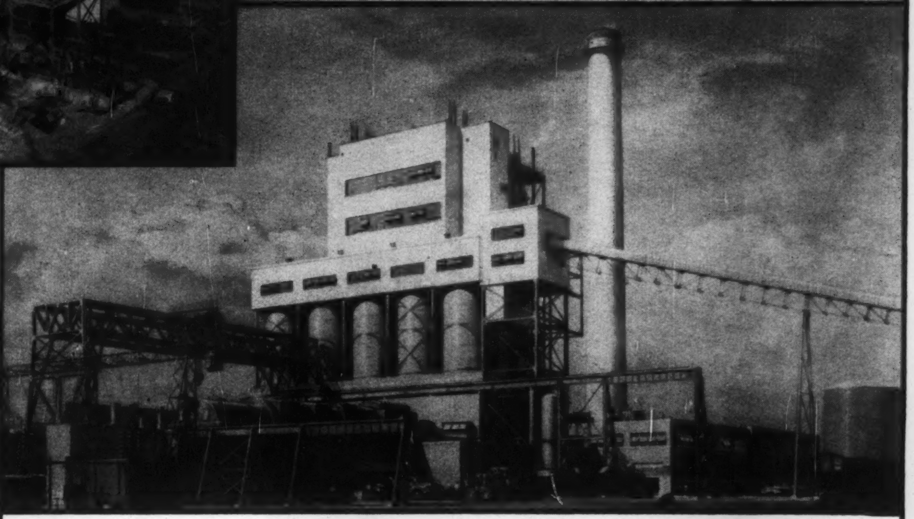

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Major Building Projects

PRUDENTIAL CENTER in Boston is one of the large urban "center" projects now under construction. A 52-story tower will dominate the project.

Buildings—New England

• **West End development**—A $30-million urban renewal project is under way on a 48-acre plot in Boston, Mass., overlooking the Charles River. Demolition is now underway and construction of 2,400 middle-income apartment dwellings will begin early this year.

• **Power project**—Yankee Atomic Electric Co.'s 134,000-kw nuclear power plant at Rowe, Mass., is nearly completed on the exterior. Work remaining for the interior will hold up the project's completion until late 1960. The pressurized water reactor is housed in a 125-ft-dia steel sphere.

• **Automated post office**—A $20-million post office with an automatic mail-handling system is under construction in Providence, R. I. Six bays roofed with concrete barrel arches will cover the building.

• **Prudential Center**—Foundation work is under way for the center section of the $100-million Prudential Center project in Boston, Mass. This section of the complex will include the 52-story Prudential Tower Building and three other commercial buildings. The entire Center will cover 31⅓ acres, and provide business, civic and residential development.

Middle Atlantic

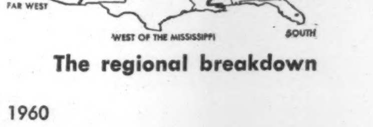
• **New York City skyscraper**—No. 2 Broadway is a 32-story skyscraper in lower Manhattan, which cost more than $30 million. The building has a curtain wall facade of glass spandrels and aluminum mullions, and has a total rentable area of about 1.3 million sq ft. The structure was completed last year.

• **Capitol extension**—The extension of the east front of the Capitol building in Washington, D. C., is about 50% complete. The $17-million renovation is the first major change in the Capitol's form in about 100 years. Also included in the modernization of the Capitol is a $4-million Senate subway terminal under the Capitol steps.

• **Washington building**—The $66-million Third House Office building is under construction in Washington, D. C. The building is 9 stories high. It includes a three-level underground garage for 1,600 to 1,800 automobiles, a basement, sub-basement and penthouse. The gross floor area will be 2.37 million sq ft. Completion is scheduled for 1963.

• **U. S. Mission**—The U. S. Mission to the United Nations in New York City consists of a 12-story office wing, an adjoining service core and a 2-story auditorium wing. The facade of the office wing features cast stone, which form a series of hexagonal frames for the glass curtain wall. The stone screen has a 14-in. overhang. The building is scheduled for completion this year and will cost $3.6 million.

• **Cantilever hangar**—The new six-bay Hangar 17, now being built at New York International Aiport is a cable-suspended steel cantilever construction. It will cost $10 million and be completed this year.



The regional breakdown

• **Rochester civic center**—Construction is under way on a $50-million complex in Rochester, N. Y., which will include office, courts and public safety buildings. Above a two-level 1,200-car underground garage, steel is going up for a courts building. Twenty-six acres of old buildings have been cleared for the project.

• **Race track**—Aqueduct Race Track was completed last year in the Borough of Queens, New York City, at a cost of $33 million. Located on a 203-acre lot, the project includes a 1⅛-mile dirt track with one-mile chute, a one-mile turf track and a ⅞-mile steeplechase. The grandstand structure is ⅓ mile long, 350 ft deep and 110 ft maximum height.

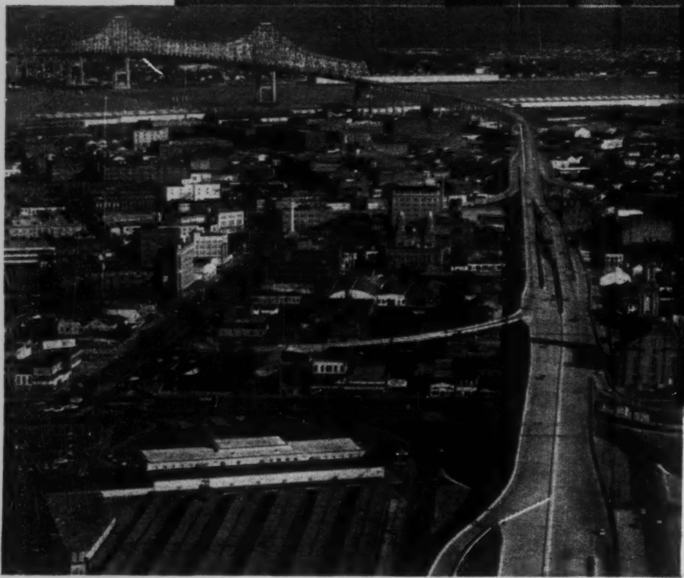
• **Grand Central City**—Construction began late last year of the $100-million Grand Central City skyscraper in midtown Manhattan. The 59-story, 2½-million sq ft structure will stradle existing railroad tracks and will cover 3½ acres of real estate. Construction plans call for erection of the structural frame for the new tower concurrently with demolition of the existing six-story building now on the site.

• **GSA projects**—Construction is progressing on the $15.3-million Federal Office Building No. 6; the $36-million Smithsonian Institution's Museum of History and Technology; and the $49.2-million State Department annex—all of these projects are located in Washington, D. C. They are being built under the supervision of the General Services Administration. These new federal buildings are of reinforced concrete construction and are faced with limestone.

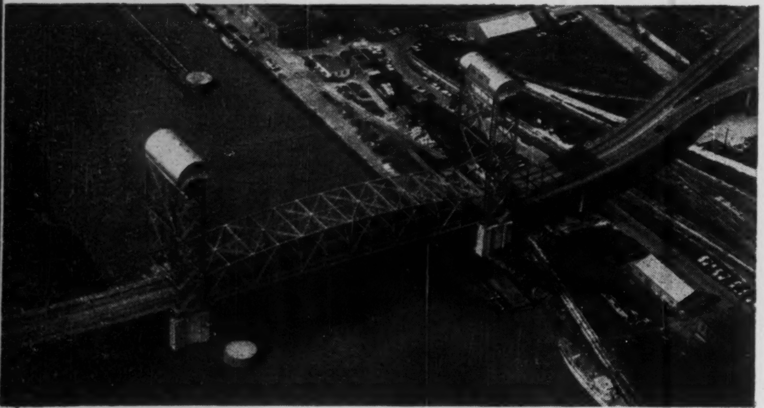
• **New York school**—The oustanding feature of the New York School of Printing is its seven-story curtain wall of green glass block. It sheathes both sides of the shop and academic wings of the school. The block incorporates a blue-green diffusing screen to cut down brightness and instantaneous heat gain. The $6.2-million school is the first multi-storied building in the city to use floor-to-ceiling glass walls without masonry backup. The auditorium is faced with brick.

• **Stone church**—The $9-million Cathedral of Mary Our Queen is a completely load-bearing stone and masonry wall structure. The building, just completed in Baltimore, contains no structural steel. The walls of the cathedral have a brick core under a facing of limestone. Base courses are granite. The structure is 373 ft long, 239 ft

Pas Manchac Bridge. 111 Prestressed Cylinder Piles. Client and Engineers: the Louisiana Department of Highways.



Mississippi River Bridge Approaches. 6,357 Step Taper Piles. Client: Louisiana Department of Highways. Engineers: D. W. Godat & Assoc.; Hardesty & Hanover; Tippetts-Abbett-McCarthy-Stratton.



Inner Harbor Navigation Canal Bridge. 547 Step Taper Piles. Client and Engineers: La. Dept. of Highways.

Bayou Boeff Bridge. 491 Step Taper Piles. Client and Engineers: Louisiana Department of Highways.

Bridge Design Engineer (except for Pontchartrain Causeway) J. B. Carter, now Assistant Chief Engineer for the Departmen

Causeway Blvd. Interchange. 3,808 Step Taper Piles. Client: Louisiana Dept. of Highways. Engineers: Palmer & Baker.

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Lake Pontchartrain Causeway. 4,886 Prestressed Cylinder Piles. Client: Greater New Orleans Expressway Comm.; Engineers: Palmer & Baker.

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CENTURY CITY in Los Angeles is another urban "center" project—this one in planning. The $500-million construction job will take 15 years.

wide and 163 ft tall at the towers. There are more than 200,000 cu ft of structural self-supporting limestone.

• **Grand brewery**—A $16-million brewery in Baltimore, Md., was started last November. Carling Brewery will have an initial capacity of 800,000 bbl a year, making it the fifth largest in the U. S. Completion date is April 1960.

• **Medical Center**—A $20-million Jewish Medical Center was completed last year in Baltimore. The center consists of eight connected buildings the largest of which is a general hospital five stories tall. There is also a heliport for landing emergency patients.

• **Pittsburgh Auditorium** – Pittsburgh, Pa.'s Public Auditorium with its movable domed roof will cost $20 million when completed. The stainless steel-skinned dome is 415 ft in dia. and weighs 1,350 tons. It is composed of six movable and two fixed sections. At the push of a button, the movable leaves will roll on rails anchored atop a 20-ft wide concrete ring girder that encircles the auditorium.

• **Pittsburgh office building**—Gateway No. 4 is a $16-million 22-story office building within Pittsburgh's Gateway Center. It has a facade of gray stainless steel and glass. Completion is scheduled for early 1960.

• **Gold hotel**—The $15-million Hilton Hotel in Pittsburgh's Gateway Center was dedicated last December. It is a 22-story building with an anodized gold aluminum exterior. One unusual feature is that about one-third of the windows are "blanks"; the glass is backed with plaster walls to achieve a desired design effect as well as to provide insulating value.

• **Time & Life Building**—The 48-story Time & Life Building located in New York City's Rockefeller Center is nearing completion. The $70-million structure has a 587-ft tower set back from the street to provide a promenade and plaza; a seven-story L-shaped base block extends along the other two sides of the tower. Vertical bands of limestone run the full height of the structure. The building is now partially occupied.

• **Union Carbide headquarters** – Construction is nearing completion on the Union Carbide Corp.'s new $46-million home office building on Park Avenue in New York City. The exterior will feature stainless steel mullions and gray tinted glass. Three-quarters of the 52-story office building will sit over the tracks of Grand Central Terminal.

• **Tower of glass**—The Corning Glass Works Building in New York City was completed last year. The structure is 28 stories high and contains 365,000 sq ft of office space. The exterior is glass.

• **Manhattan bank**—The walls are up for Chase Manhattan Bank's $130-million, 60-story office building in New York City's financial district. The structure has a steel frame and aluminum and glass curtain walls. A block-wide plaza will be constructed in front of the building. Final completion is scheduled for 1962.

• **Guggenheim Museum**—The controversial Guggenheim Museum in New York City was completed last year. The $3-million reinforced concrete building has a spiral ramp instead of conventional floors. The ramp makes six turns rising 11 ft per turn. Works of art are displayed along the curved walls.

• **Buffalo skyscraper**—The first major office building to be erected in Buffalo, New York, in more than 30 years was completed last year. The 20-story skyscraper, called 10 Lafayette Square Building, contains 165,000 sq ft of office space and has a glass and aluminum facade.

• **Nuclear generating station**—The $100-million nuclear electric generating station at Indian Point, New York, is scheduled to go into operation in 1961. The station will have an electric generating capacity of 275,000 kw. Consolidated Edison Co. of New York, Inc., is the owner-builder.

• **Insurance building**—The Prudential Insurance Company of America is building a $20-million office structure in Newark, N. J. The building will have marble exterior walls with granite trim, and will contain more than 500,000 sq ft of usable space. The 24-story main structure and one seven-story wing will be completed this year. Another seven-story wing will follow.

• **State offices**—An $18-million Baltimore office complex for the State of Maryland was completed in 1959. There are three buildings: the largest is a 15-story structure with 440,000 sq ft of floor space for the use of the governor and state agencies. The other two buildings are each six stories tall.

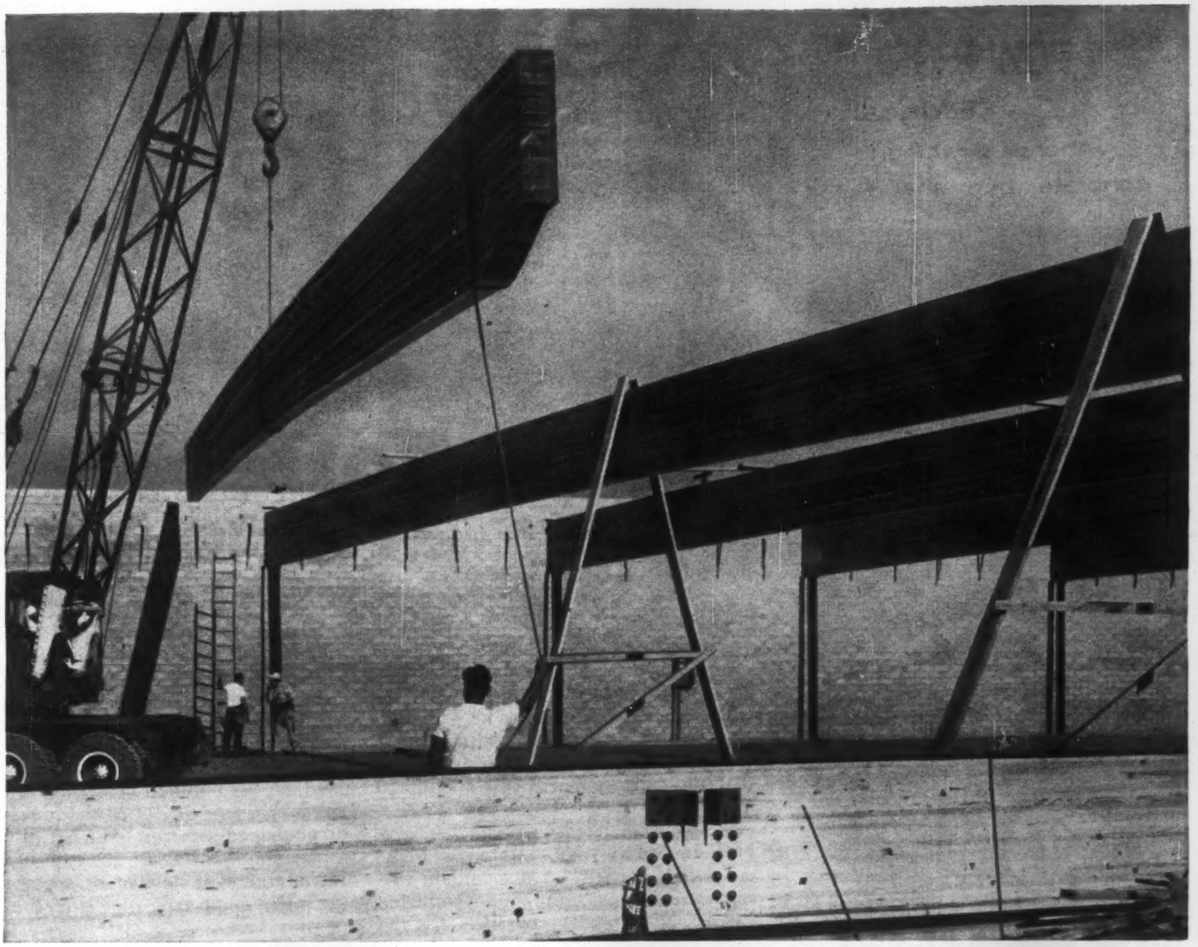
• **Federal building**—A $27.5-million federal building in Baltimore County, Md. is being constructed as three structures in one. Tallest is a 10-story structure that connects with a 5-story operations building by means of another 5-story connecting link. This Social Security Administration building is scheduled for completion this year.

South

• **Government structure**—The Central Intelligence Agency's headquarters in Langley, Va., will cost $46 million when completed in 1961. The 8-story building is of reinforced concrete construction and is faced with limestone.

• **Merchandise Mart** – Atlanta, Ga.'s Merchandise Mart building in downtown Atlanta was started late last year. The $15-million building will be 23 stories high and contain 1 million sq ft of floor space.

• **Radio telescope**—Construction of the Navy's $79-million radio telescope is under way at Sugar Grove, W. Va. The telescope will feature a 20,000-ton, 600-ft-dia. dish that rotates in both a horizontal and vertical plane



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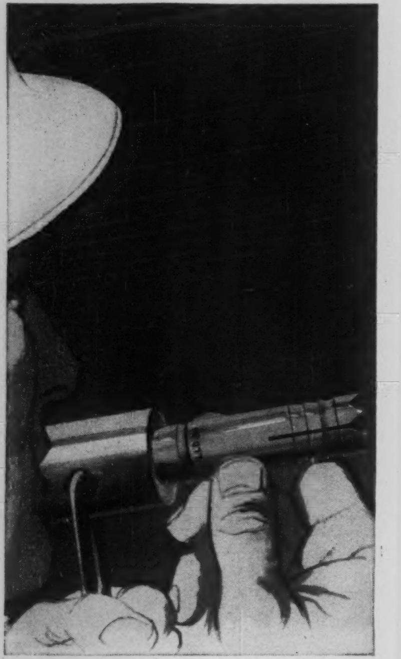

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like an optical telescope. The dish is an aluminum-lined, saucer shaped lattice work of steel members. The huge installation of concrete, open steel work, electric power and electronics will have an optical range of 38 billion light years—19 times more powerful than the 200-in. Palomar optical telescope in California.

• **Greenbank telescope**—The second biggest radio telescope in the U. S. is now under construction at Green Bank, W. Va. The 60-ft high telescope features a 140-ft dia dish with an area of about ⅜ of an acre. The dish is made of aluminum tubing covered by ¼-in. aluminum plates, each 25 ft long and 12 ft wide. The cost of the telescope will run to $5 million plus the cost of additional facilities at the site. It is being built for Associated Universities, Inc., a non-profit organization of nine eastern universities.

• **Glass plant**—Excavation work began in December for the Ford Motor Co.'s glass plant expansion program at Nashville, Tenn. The expansion will double production capacity, and add 270,000 sq ft of floor space. It is reported that the expansion will cost about $20 million.

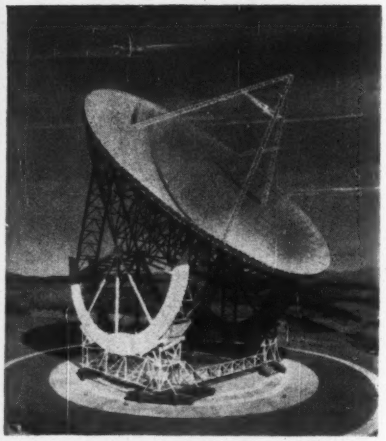
• **Miami brewery**—A $20-million brewery with a capacity of one million barrels of beer per year was completed in early 1959 at Tampa, Fla., for the Jos. Schlitz Brewing Co.

• **Southern steam plant**—Wilsonville Steam Plant in Birmingham, Ala., will cost $142 million when completed in 1962. Since the start of the project in 1957, expenditures already total more than $65 million. Two units of the plant have been installed; two more will be forthcoming to give the completed plant a 1-million-kwh generating capacity.

• **Miami airport**—The $25-million Miami International Airport opened last February with five finger piers. Work will be completed early this year on the 441-ft extension of the main terminal building, and work will start on a sixth loading finger. Also added last year was a 250-room hotel atop the terminal building.

Middle West

• **Cleveland office building**—The East Ohio Building, a $15-million, 21-story structure of aluminum and glass curtain wall construction was completed in Cleveland last year. It contains more than 300,000 sq ft of floor space. An adjoining 8½-story garage has parking space for 550 cars.



GIANT TELESCOPES demand new techniques in design and construction.

• **Illinois Assembly Hall**—In spite of four months construction time lost because of the steel strike, the $7.5-million assembly hall being built by the University of Illinois on its Urbana-Champaign campus is 12% finished, with completion now scheduled for August, 1961. A $6.5-million construction contract was awarded last May for the big dome-shaped structure which will have a maximum seating capacity of 19,000. Its interior will be free of any pillars, since the dome type roof is of the suspension type.

• **Detroit Convention Hall**—Detroit's Convention Hall, a three-level circular building is scheduled for completion this year. Total land area covered by the project will be 17 acres including five acres of floor space. The structure will have a maximum seating capacity of 14,000. It will contain four, 100,000-sq-ft exhibition areas, three of which can be combined into one large hall by retraction of separating partitions into the roof construction. Total cost of the project is $54 million.

• **Post office building**—A five-story mail handling building with an attached 10-story office building is now under construction in downtown Detroit by the U. S. Post Office Department. The $23-million structure is scheduled for completion this year. Construction began in mid-1959.

• **Ohio refinery**—The Standard Oil Co. (Ohio) dedicated its new $40-million integrated refinery at Toledo, Ohio, last May. The new plant was designed for fully controlled straight through manufacture of a diversity of high quality petroleum products. The refinery is a

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• **Geodesic dome**—The "showcase for metals"—the $2.5-million headquarters for the American Society for Metals, near Cleveland, was completed last year. A weblike geodesic frame, 250 ft in dia, forms a canopy over the structure. Except for glass walls the three level semicircular building is all metal: aluminum dome, stainless steel stairs, doors and sunshades, aluminum window frames, bronzed door handles, brass light fixtures and copper screening.

• **Cement plant**—The Dundee Cement Co.'s $25-million cement plant in Dundee, Mich., was 99% completed in 1959. The production capacity is 5 million bbl per year.

• **Chicago's exposition center**—Construction of the $34-million exposition center at Chicago has passed the halfway mark. The 1,080x340-ft two-story structure will be finished by mid-November 1960. It will furnish 300,000 sq ft of exhibition space and contain a 5,000-seat auditorium.

• **Indiana steel mill**—Five major expansion projects, costing more than $60 million, will get under way this spring at the Youngstown Sheet and Tube Co.'s Indiana Harbor Works in East Chicago, Ind. Contracts have been awarded for major items of equipment and four new buildings.

• **Nuclear power plant**—Full-scale operation of the Commonwealth Edison Co.'s 180,000-kw nuclear power station southwest of Chicago is expected by mid-1960. The $45-million project —first full-scale privately financed nuclear power plants in the U. S.—went "critical" last Oct. 15. Since then the plant has been undergoing extensive tests and mechanical adjustments preparatory to full-scale operation.

• **Atomic plant**—The $75-million Enrico Fermi atomic power plant near Detroit will be completed late this year. Key parts of the project; a reactor containment building; sodium storage and purification building; plant offices and control center; boiler house; water treatment plant and turbine house. There will be a total of 14 buildings located on a 1,500-acre site.

West of Mississippi

• **Suspended roof**—The Villita Assembly Building in San Antonio, Texas, features a roof that is suspended on 200 steel cables. It is attached to an

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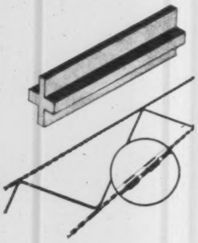

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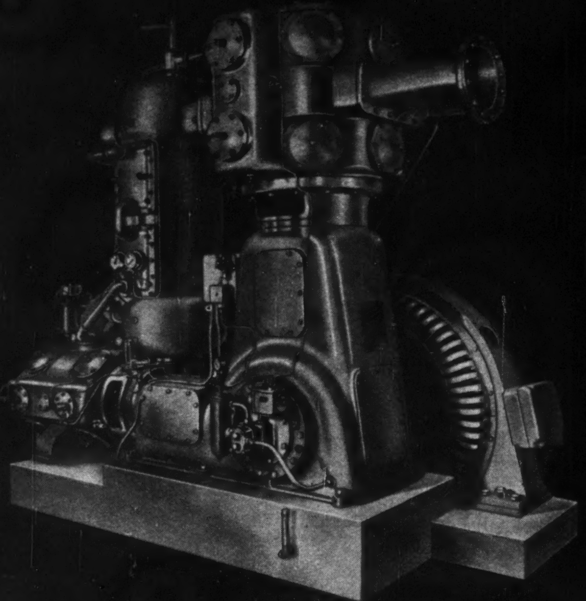

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outer ring 132 ft in dia. and a 40-ft inner ring. There are no interior columns. The interior walls are formed by 2x4 latticing and the ceiling is paneled for acoustical advantage. The $850,000-building contains 29,000 sq ft.

• **Minneapolis bank** – The First National Bank building in Minneapolis, Minn., will be completed this spring. The 28-story structure will cost about $15 million.

• **Air Force Academy**—Only two major projects remain to be finished at the $137-million U. S. Air Force Academy near Colorado Springs, Colo. The 506-room, $3.4-million hospital, now 75% finished, will be completed by next September. The 1,500-seat cadet chapel, featuring 17 soaring aluminum spires, is 5% finished and scheduled for completion by May 1961 at a contract cost of $3.4 million. Major projects completed during 1959 included the $19.6-million academic complex; the $15.4-million cadet quarters with 1,320 two-man rooms; the $2.7-million administration building; the $4.9-million cadet social center and 3,000-seat theater; the $7.3-million cadet physical education complex; and 1,200 Capehart family housing units costing $17.5 million.

• **Houston bank**—The 32-story First City National Bank Building is going up on a square block area in downtown Houston, and will cost more than $20 million. The building will contain 900,000 sq ft of space. Its facade is glass curtain wall. Completion: 1960.

• **Chrysler plant**—Chrysler Corp.'s 25-acre automobile assembly plant in St. Louis, Mo., was completed last year. The main building measures 1,500 by 720 ft by 54 ft high and has 1.4 million sq ft of floor space. Six independent smaller buildings also stand on the 235-acre site. Estimated cost of the plant is in excess of $40 million.

• **Denver hotel**—The $20-million Denver-Hilton hotel was 90% finished at the end of 1959, with official opening scheduled Mar. 15, 1960. The 20-story hotel tower has 884 guest rooms.

• **Dallas center**—The first two units of the $35-million Southland Center development in downtown Dallas were completed last April. The project includes the 42-story Southland Life tower, tallest office building west of the Mississippi River and the 28-story 600-room Sheraton-Dallas hotel. Foundations also are completed for a future 36-story office tower adjacent to the Southland Life tower.

KAISER INDUSTRIES will spend $45 million for its Oakland, Calif. headquarters.

• **Research center**—Construction will get under way this spring on a 14-story, $10-million administration building by Minnesota Mining and Manufacturing Co. It is the latest addition to the company's research center east of St. Paul, Minn. The 338x90-ft building will contain 500,000 sq ft of air conditioned space. Its exterior will be finished with cut stone, tinted glass and aluminum.

• **Airlines headquarters** – Northwest Orient Airlines' new headquarters and overhaul base near Minneapolis, Minn., is being constructed so that all operations—from executive offices to overhaul—will be under one roof. The $18-million structure will have one million sq ft of office space. It will include five hangars, each 320 ft wide. Completion is expected late this year.

Far West

• **Seattle building**—Unusual structural methods brought savings of more than $200,000 in the $10-million Washington building, to be completed early this year in Seattle. The building is framed with split and rewelded beams. The split beams were shop-fabricated from 18-in. WF beams cut lengthwise in a zigzag fashion; the halves then were welded together to produce a 27-in. beam with hexagonal openings. The split beams weigh only 70 lb per ft, compared to 145 lb for conventional beams of the same depth.

• **Hawaii airport**—Construction began last February on a $20-million jet airport at Honolulu, Hawaii. Bids were opened in December for the $1-million international and foreign arrival unit, for the $4.3-million overseas departure and arrival unit and for the $1.5-million drainage, sewer and communication systems.

• **Giants' ball park**—Candlestick Stadium, the San Francisco Giants' new $15-million ball park, was completed last year. The stadium contains 45,000 seats, including two main levels, a mezzanine for press and radio and loge seats. More than 20,000 seats of the open air stadium are underlain by a radiant heating system.

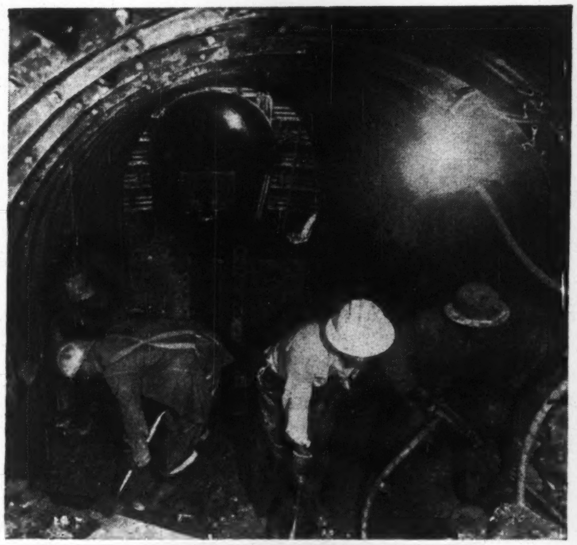
• **Seattle exposition**—The development of Century 21 Exposition, a science fair ground in Seattle, Wash., began last year. Public structures on the 74-acre site will cost $14 million. Century 21 claims a three-fold purpose: it will promote U. S. science; it will promote Washington State as a trade and industrial center; and when the Exposition has ended its six months' run, in 1962, it will leave Seattle with a $7.5-million civic center.

• **Tishman office building**—The 22-story Tishman office building in downtown Los Angeles is under construction at a cost of $15 million. The structure is reported to be the first all-rental office building to be constructed in that area since World War II. It will be faced with blue mosaic tile, vertically divided by extruded aluminum fins and will have 335,000 sq ft of rentable area.

• **Atomic reactor**—A $145-million plutonium production reactor is being built for the U. S. Atomic Energy Commission at Hanford Works near Richland, Wash. The plant will produce special nuclear materials. Work began in May 1959. Work for 1960 includes construction of a water treatment plant, the second phase of the river power house, a standby power house, heat exchanger building, reactor building and a high lift power house. Also half-way towards completion at the site is a $15-million plutonium recycle test reactor. The project features a steel plate containment vessel, 80 ft in dia and 125 ft high.

• **Crown Zellerbach Building**—The $15-million Crown Zellerbach Building in San Francisco was completed late last year. The 20-story structure with its 255,000 sq ft of gross area occupies only ⅓ of a 1⅓-acre site. It floats on an eight-foot-thick concrete mat which contains 16,000 cu yd of concrete. The exterior of the building is glass and aluminum.

• **Dodger stadium**—Initial excavation for the Los Angeles Dodgers' Baseball Stadium began in 1959. Construction of the $15-million stadium will be underway in 1960. The structure will have seating for 55,000 fans and parking facilities for 16,000 cars.



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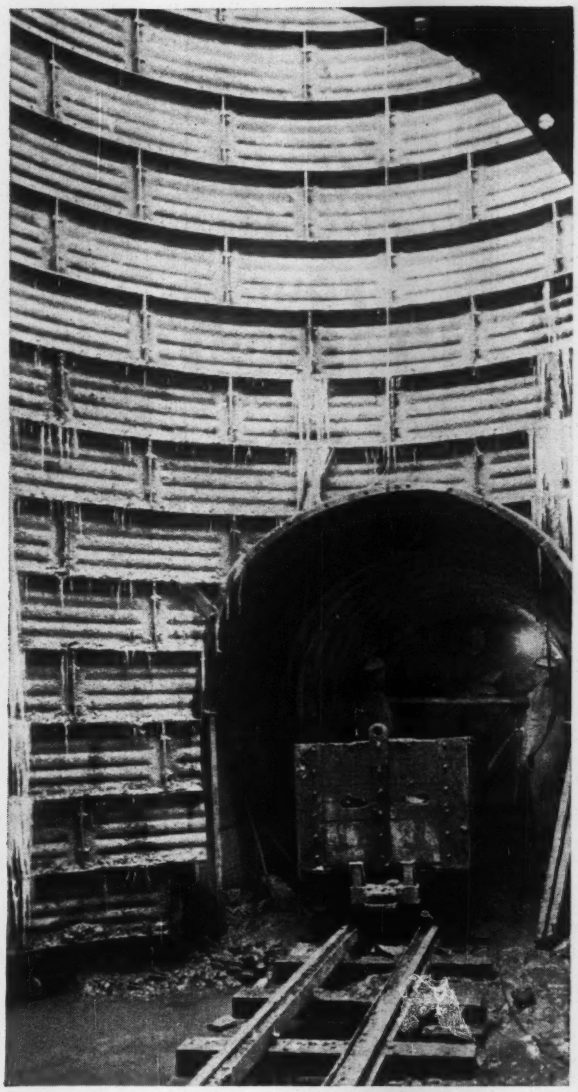

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GUGGENHEIM MUSEUM in New York ranks as 1959's most talked-about building.

- **Century City**—Webb & Knapp, Inc., is developing 176 acres of Twentieth-Century Fox Film Corp.'s movie lot into a community of 56 apartment houses, four office buildings, a shopping center, a hotel, a theater, an auditorium and a motion picture museum. The first building of the $500-million project got underway in 1959. Total completion is scheduled for 1975.

- **University project**—Construction involving $51 million was underway last year at the University of California at Los Angeles. The work included 20 projects, two of which were completed in 1959. Four projects totalling $12.7 million were awarded late in the year. U.C.L.A. is involved in a building program, which has seen about $150 million spent for construction during the last 10 years.

- **Los Angeles schools**—At the end of last year about $55 million in school building construction was under way for the Los Angeles City Board of Education. An additional $23 million was completed during the year. Work in 1959 included $20.4 million in construction on elementary schools and $21.3 million on high schools.

- **Los Angeles Plaza**—Barrington Plaza, no wonder construction in Los Angeles, will include three apartment buildings —one 22 stories, the others 17 stories— and one two-story office building. Total cost of the project is $15.2 million. By the end of this year $6 to $7 million in contracts are expected to be let.

- **Los Angeles Civic Center**—Work progressed on the $350-million, 18-building Los Angeles Civic Center. During 1959 the exterior of the $25-million county administration building was completed; and the steel framework was 80% up for the $11½-million 9-level Hall of Records. Construction for a $16-million county jail will begin in late 1960.

- **California Bank**—California Bank is building a $15-million headquarters building in Los Angeles. The 18-story structure will contain 370,000 sq ft of space. The exterior facing is of limestone. Completion is scheduled for this July.

- **College development**—San Fernando Valley State College is continuing its development of a $28-million campus. Completed during 1959 were a women's residence hall, music building, and a fine arts building. A science building now under construction will be completed this year.

- **Power plant**—The first unit of the South Bay power plant near San Diego, Calif., will be completed this year. Its cost is $22.5 million. Eight units in all are contemplated for the steam electric generating plant, each with 142,000 kw capacity. San Diego Gas & Electric Co. is the owner.

- **Insurance building**—The Travelers Insurance Co. building in Los Angeles was started in October 1959 and is scheduled for completion in 1961. The $15-million structure will be 22-stories high and contain 450,000 sq ft.

- **Steam plants**—The Los Angeles Department of Water and Power completed the second unit of its Scattergood steam plant last year. The plant now has two units, each with a capacity of 160,000 kw. The total planned capacity is for 1.2-million kw with six generating units at a total cost of $65 million. Work also continued on the department's Haynes steam plant, whose ultimate cost is estimated at $63 million. The first unit of the plant will have a capacity of 230,000 kw and is scheduled for completion in 1963.

- **Hall of Justice**—A $16 million Hall of Justice is underway for the City & County of San Francisco. The seven story building will contain 580,000 sq ft of floor space for courtrooms, traffic control offices, a jail, coroner's office and police department. Completion is scheduled for mid-1961.

- **Kaiser Center**—Under way is a $45-million building complex in Oakland, Calif. It centers around a 28-story structure, which contains 1.68 million sq ft gross area, and will be headquarters for all Kaiser industries. The com-

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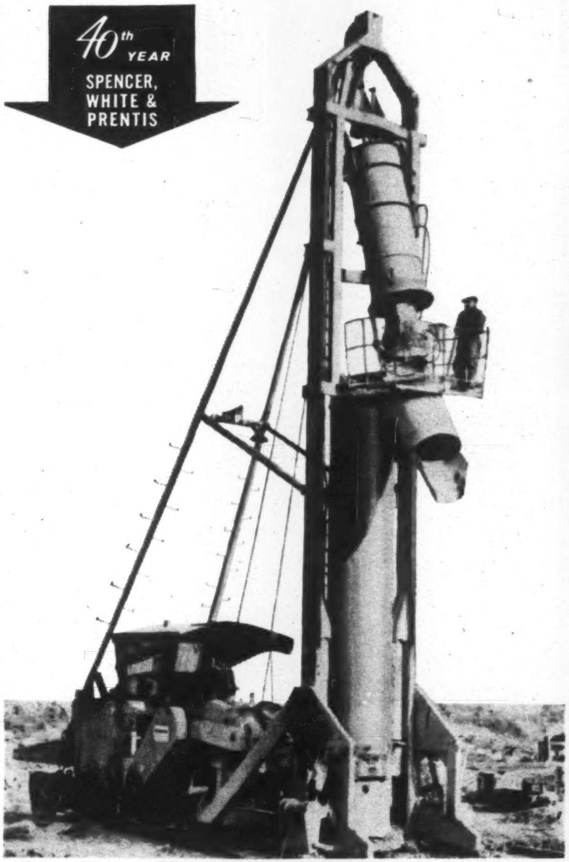
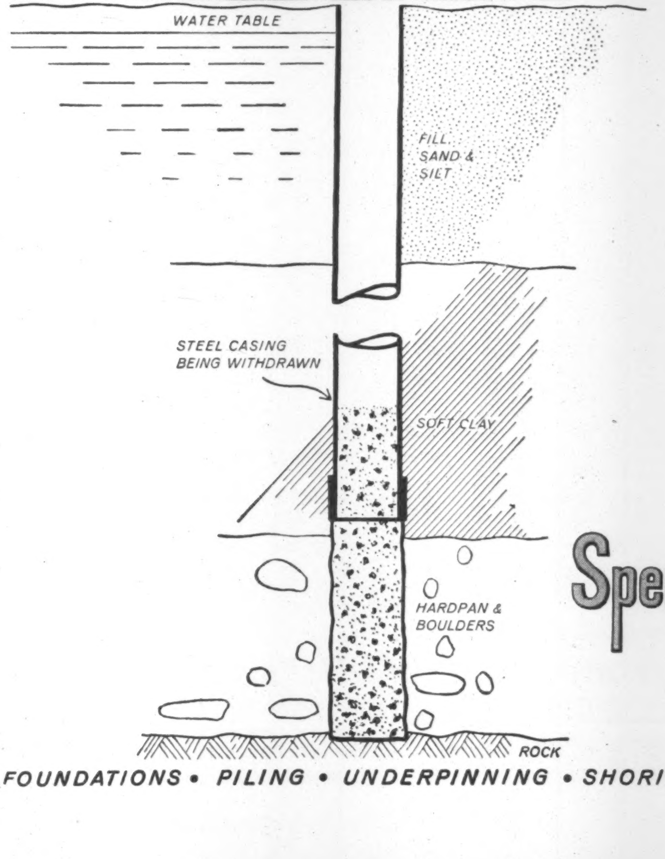


another foundation service by Spencer, White & Prentis

BENOTO PROCESS CAISSONS

These caissons offer the following advantages, among others:

- **Provide high bearing capacity**
- **Can be installed under difficult conditions and to great depths**
- **Can be accurately installed at batter up to 15°**



Through 4 decades as foundation specialists, Spencer, White & Prentis has always sought to provide a full range of services with full dependability. The Benoto Process Caisson, now added to our other specialties, has been proved in use through a number of years, most recently on foundations which we installed for additions to the Chicago Post Office and the Sheraton Hotel in that same city. Economy was a feature of both jobs.

The caissons, which range up to 43 in. in diameter, can be installed to great depths. The sketch at left shows installation to 120 ft., which was the depth at the Sheraton Hotel addition.

Let us tell you more about Benoto Caissons and the types of installations for which they are most advantageous and most economical.

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FOUNDATIONS • PILING • UNDERPINNING • SHORING • COFFERDAMS • SPECIAL SERVICES plex also includes three floors of shops and a five-story 1,200-car garage.

- **Shopping center**—Lloyd Center, a $30-million shopping center in Portland, Ore., will contain 1.2 million sq ft of rentable space when completed this year. The center will cover 56 city blocks. Among the buildings already completed are a $6-million hotel and a supermarket.

- **California State buildings** – California's state building program in 1959 totaled $147 million, and plans have been announced for $150 million worth of work in 1960. Work was started last year on the $21-million prison, California Men's Colony at San Luis Obispo. Other major work included dormitories at state colleges and classroom facilities.

- **Norton Building**—The first skyscraper to use prestressed concrete beams is the 21-story Norton Building, completed last year in Seattle. The $12-million project has beams 70 ft long, 37 in. deep with 30-in. flanges on 10-ft spacing.

- **Ala Moana center**—The first increment of $33 million Ala Moana shopping center in Honolulu was completed in 1959. There are now two levels of stores with 600,000 sq ft of selling space and parking for 5,000 cars. The completed center will have 1 million sq ft of store space. The center is a project of Hawaiian Land Co., a wholly-owned subsidiary of Hawaiian Dredging and Construction Co., Ltd.

- **Mammoth resort**—A $350-million resort community for 50,000 people began to get underway near Honolulu last year. Grading was done on three subdivisions; marina peninsulas on a salt water lake were started by developers. Sewer, water and utility systems and streets are scheduled for construction in 1960. The 6,000-acre development will include hotels, apartment homes, recreation areas and marinas. Kaiser Hawaii Kai Development Co. are the owners. Major areas are scheduled for completion in 1964.

- **Hawaiian refinery**—Standard Oil Company of California is constructing a refinery on Oahu, Hawaii, with a capacity of 32,000 bbl a day. The $40-million project includes four floating roof storage tanks of 242,000-bbl capacity each; a 150,000-bbl floating roof tank and a 25,000-bbl tank. A 30-in. underwater pipeline will run offshore to accommodate tankers. Another pipeline will deliver finished products from the refinery to the distribution center. Completion is scheduled for this fall.

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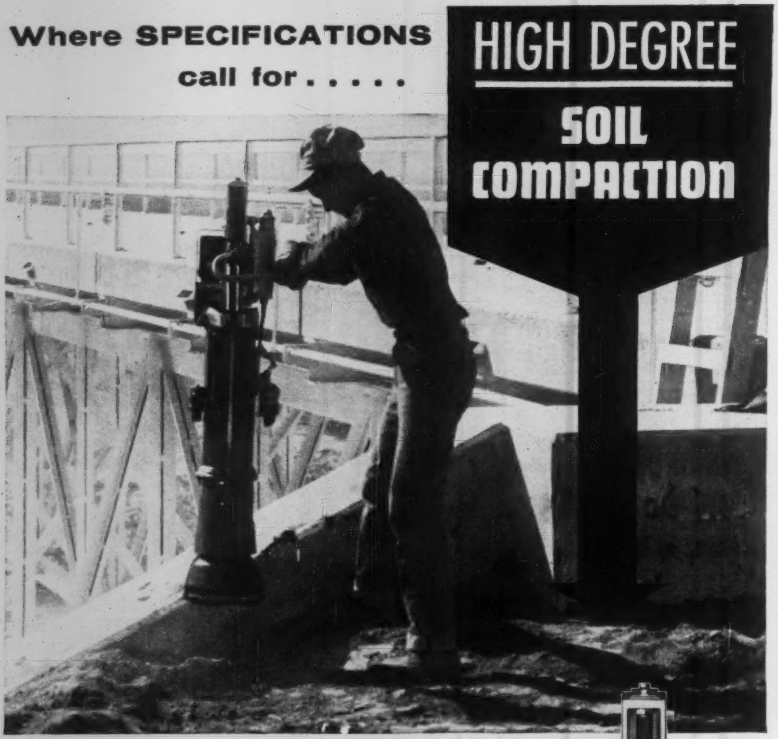

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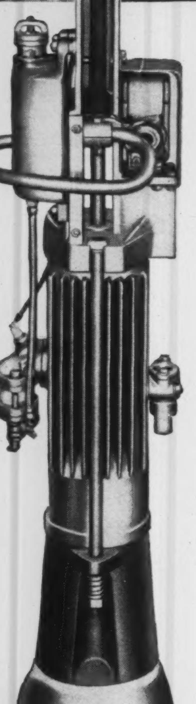

YOU can't get *high degree* SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches.

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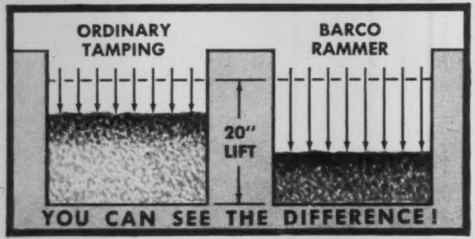

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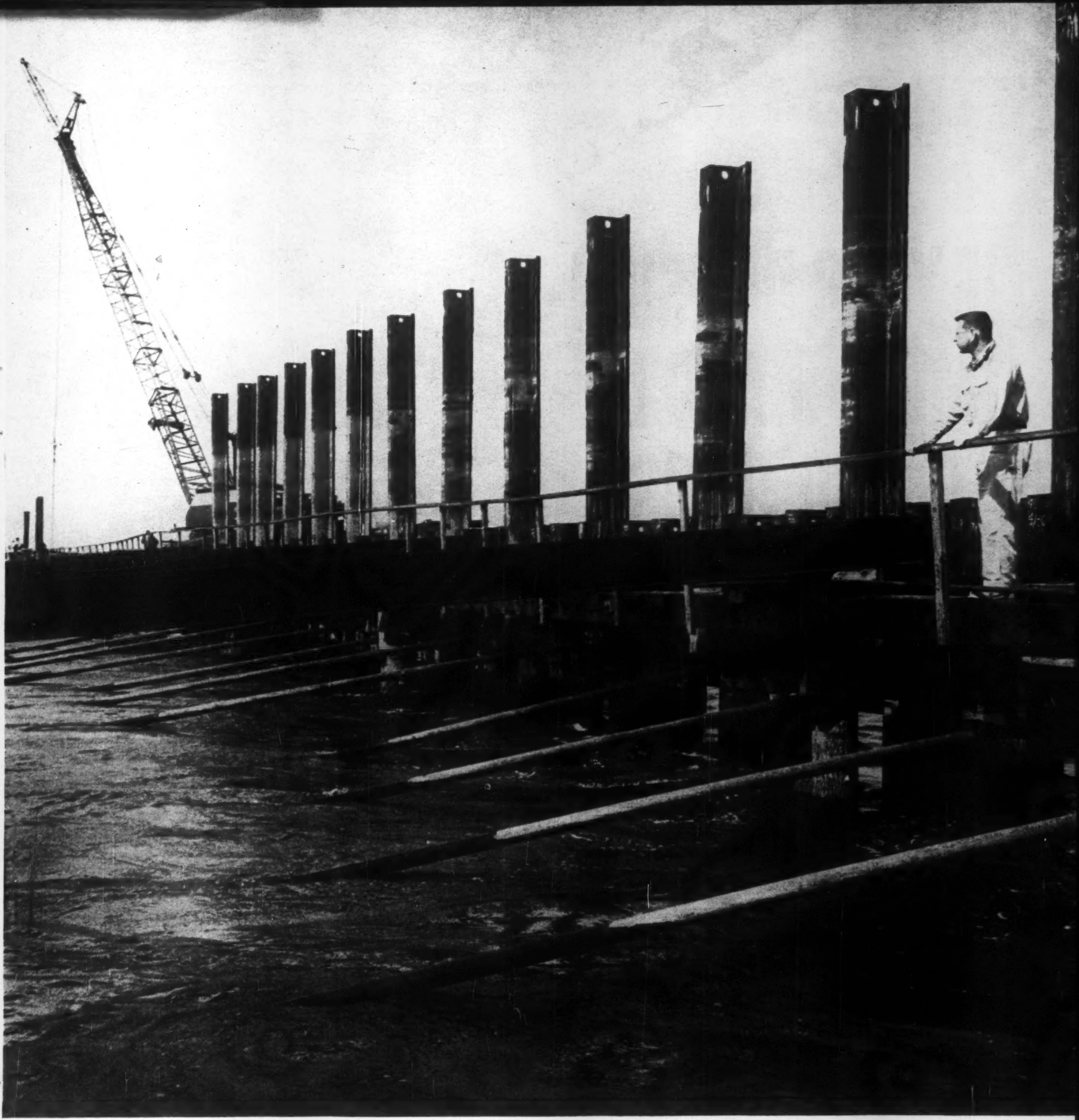

These Bethlehem multiple-unit tie rods are 105 ft long. But Bethlehem supplies multiple-unit tie rods in much greater lengths. Any lengths, to be exact. Cut-thread tie rods, plain or upset, in diameters through 4½ in. Rolled-thread tie rods in diameters through 1½ in. Single-unit tie rods up to 65 ft long. Both multiple- and single-units can be ordered straight or bent, asphaltum-dipped, or hot-dip galvanized. Delivery is fast. Just call or write the nearest Bethlehem office.

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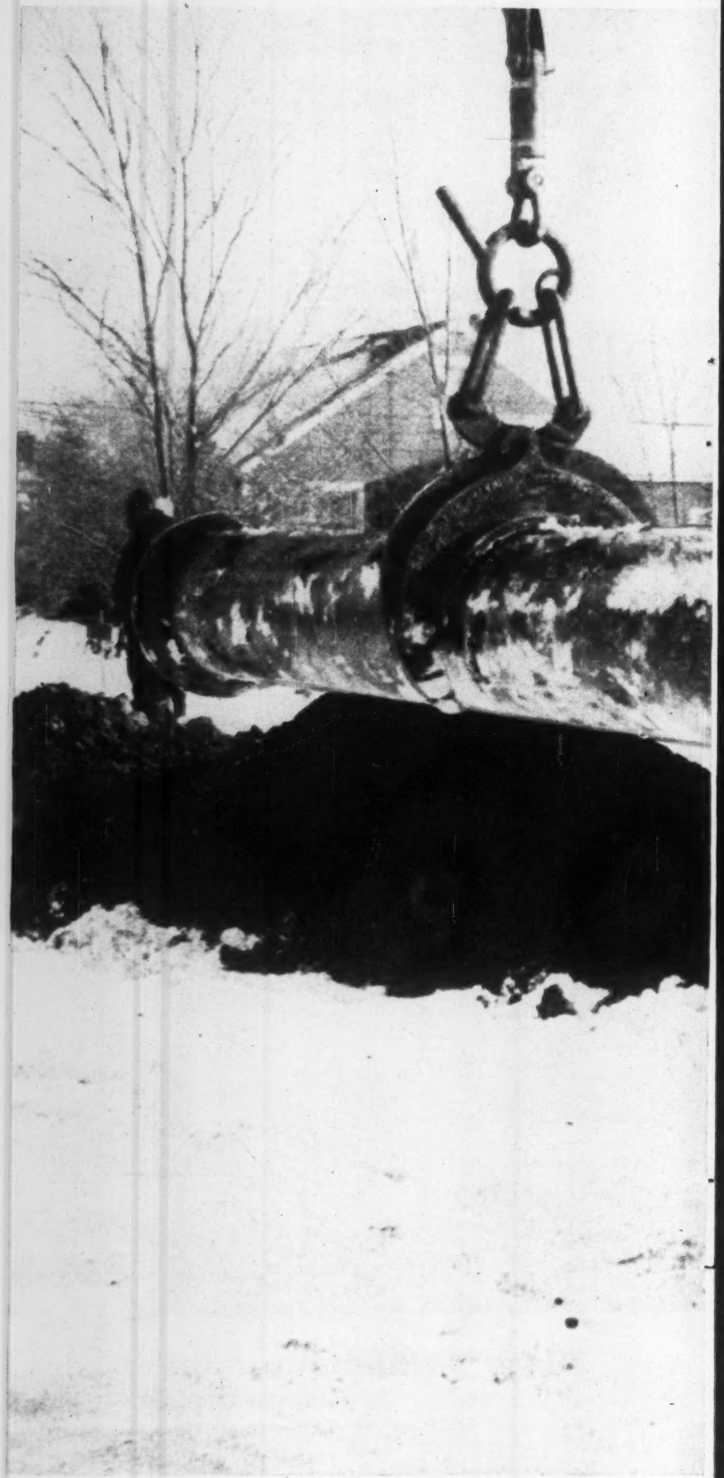
If your decision today will in some way determine your town's water supply system for the next century, consider the case for cast iron pipe:

- Cast iron pipe is built to *last*—96 American cities will testify to that. They've had cast iron pipe installations in constant use for over a century! And in Versailles, France, they're still using cast iron pipe water mains that were laid in 1664! Solid proof that once cast iron pipe is in the ground, it stays there!
- Cast iron pipe rarely requires repair. Its rugged construction, corrosion-resistant qualities and bottle-tight, rubber-ring joints will withstand the most severe pressures. Once an investment is made in cast iron pipe, it is usually your first and last cost because of the absence of maintenance or repairs.

Don't be fooled by initial pipe costs. You can't save money on "low-cost" pipe if you have to repair and replace it frequently. Insist on the pipe that will actually save you money over a period of years—cast iron pipe!

Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 3440 Prudential Plaza, Chicago 1, Illinois



Rely on

CAST IRON PIPE

THE MARK OF THE 100-YEAR PIPE

The U.S. Has a Choice: Clean

ALL BUT FINISHED, Noxon Rapids Dam, Clark Fork River, Mont., will be completed next month. Washington Water Power Co. started work on the $87-million project in 1955. The powerhouse will have four 100,000-kw generators.

Up or Make Do With Dirty Water

- **Paradox: Prosperity, with its industrial growth and population expansion, breeds water pollution and distribution woes.**
- **Quality, not quantity, shapes up as the critical factor in the U.S. water supply for the next 40 years.**
- **First big job in pollution control is to convince the public that clean streams are worth paying for.**

The U. S. appears to be entering a period of awakening in the water resources field. Powerful voices are warning with increasing ferquency that we are too complacent about the threats massing on the horizon for our water supplies. And there are signs that we are heeding them.

Waterworks construction picked up more than 20% last year over the 1958 volume. And a further increase of 20% is expected this year. Sewerage construction enjoyed a 5% increase last year over 1958, and the volume is expected to climb 11% this year.

Still, we are doing too little. That's a common conclusion—however differently reached—of the statisticians, the chemists, the engineers, the hydrologists and the plain thinkers.

A most effective voice in bringing water supply and water pollution woes—present and pending—to the public's attention is that of the U. S. Public Health Service. Coming decades are going to find us in increasingly desperate straits for clean water, and our present technology just can't cope with the problems, according to Assistant Surgeon General Mark Hollis.

Major difficulties include swelling population concentrations and the rapid development of exotic chemical pollutants by industry, says Mr. Hollis.

What to do about it? For one thing, he admonishes, face the facts squarely. Then get more sewage-treatment-plant construction, more stream-data collection and more research.

The research may lead to an urgent need pointed out by a Hollis associate, Gordon E. McCallum, who heads up water pollution control for PHS. The need: a technological breakthrough in waste-water treatment and disposal.

At least one expert sees a brighter picture in one respect than that painted by the Public Health Service. Thomas J. Powers, manager of waste control and utilization for the Dow Chemical Co., Midland, Mich., figures we know why we have to clean up our streams and how to do the job. Our major problem, he says, is justifying the cleanup economically. This doesn't necessarily mean developing waste-treatment processes that are self-supporting, however. Public goodwill may be sufficient economic justification for big industries, he says.

The Powers view on our technological status is pretty close to that of another water sanitation expert, Edward J. Cleary. Mr. Cleary, executive director and chief engineer of the Ohio River Valley Water Sanitation Commission, sees some technical problems, but thinks we can do a great deal more before exhausting the potentialities of techniques already avilable.

The big obstacle to effective action in many instances is public reluctance to accept is responsibility, he believes. That calls for social reform, he feels; and a prerequisite for social reform is public understanding.

The public has got to understand sooner or later. Murray Stein, who heads the Public Health Service's enforcement of pollution control measures, puts the thought bluntly: **Sewage treatment is "just one of the costs of living in a metropolitan area."**

An important listener to the warnings last year was the U. S. Senate.

A select subcommittee of the Senate Interior Committee concluded a series of hearings late in the year at widely scattered points in its task of studying water resources and hydropower needs through 1980. A report will be forthcoming.

More immediate federal action in water quality preservation will be in grants to municipalities for sewerage construction. Increased aid is a strong probability in the present session of Congress. A strong drive to raise grants under the 1956 pollution-control act from $50 million to $100 million a year stalled last session.

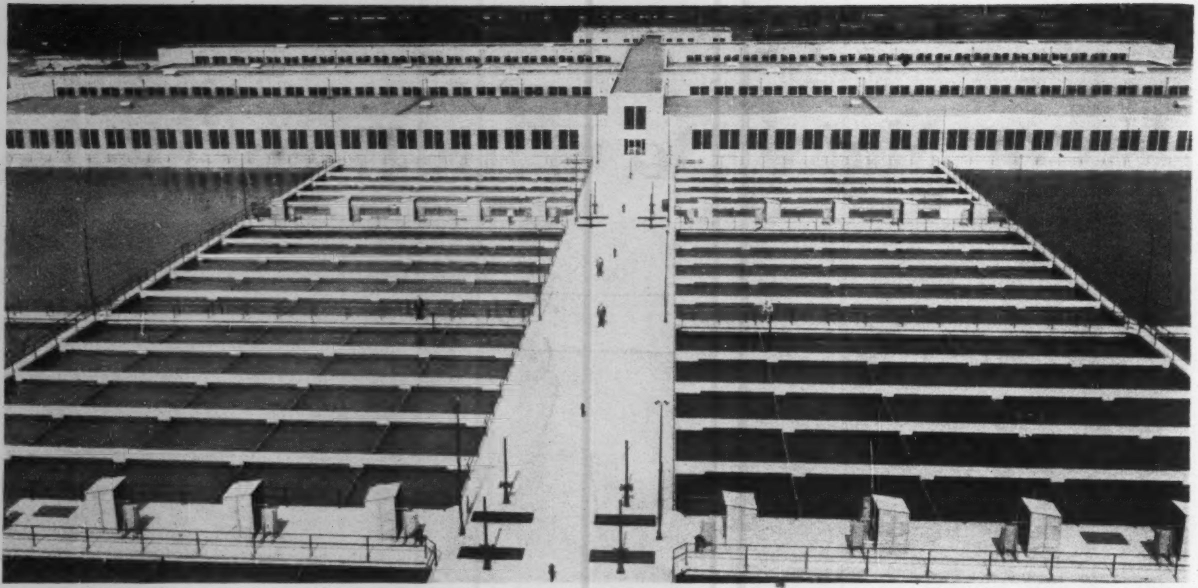
The House okayed the increase but the Senate cut it to $60 million. The two chambers are expected to work out a compromise early in the current session.

The Administration threatened a veto last year, but the prospective budget surplus this year and pressure from communities might soften White House resistance.

The Public Health Service reported last fall that 1,752 waste-treatment plants had been approved for federal aid since the 1956 law went into effect. Of that number, 687 had been completed and 592 were under construction. Estimated total cost of all approved projects was $761 million, including $145 million of federal grant money.

The campaign for public understanding of waterworks and sewerage needs has enlisted strong support. Both the Water & Sewage Works Manufacturers Association and the Federation of Sewage & Industrial Wastes Associations decided to pitch into the effort already under way by the American Water Works Association. W&SWMA engaged a professional public relations firm and FSIWA voted to add a man to its headquarters staff as the AWWA had already done.

The most remarkable evidence that



PHILADELPHIA WATER SUPPLY was in prime shape with completion last year of new $25-million Torresdale Filtration Plant. Normal output of 282 mgd makes it the second biggest filtration plant in the country. Operation is mostly automatic.

the waste-water federation means business in public relations, however, is its adoption of a new name. Since the public doesn't particularly like to talk or read about sewage, FSIWA directors voted to drop the word in favor of a title indicating the end product of the efforts of the membership. The official name of the organization is now Water Pollution Control Federation.

Pollution control at both federal and state levels may be on the verge of setting off some court-room fireworks. The Public Health Service and some state pollution-control boards have taken strong enforcement action. And although some actions have landed in court, no contender has yet fought a case to the last ditch.

Federal enforcement under the 1956 antipollution act has centered on the Missouri River so far. Sioux City, Iowa, target of the first PHS cleanup order under the statute, has engaged engineers to design a $6-million sewage treatment plant in reluctant compliance with the timetable laid down by the PHS last spring. St. Joseph, Mo., and 18 of that city's plants got a similar order last summer. What happens if St. Joseph voters refuse money for remedial construction can't be predicted with any certainty. They defeated a bond issue proposal in 1958 and could conceivably do so again. The city is trying to head off in court any further enforcement by the Public Health Service.

Actions open to the government under the 1956 act are: First, a request to a city or area to clean up; second, conferences with the city to work out a remedy; third, issuance of the type of order given to Sioux City and St. Joseph; and fourth, untried so far, a court order.

Cleanup requests have been issued to about a dozen cities and areas in the Missouri and Mississippi valleys. St. Louis, one of the dozen, expects to complete a survey of its pollution control needs next January. Kansas City is dragging its heels and seems a likely target for the next PHS cleanup order.

The PHS singled out the Missouri-Mississippi basins to start on, according to a PHS spokesman, because they are among the few major river basins left where big cities and industries discharge raw wastes into streams used for drinking water by cities farther downstream.

New York state won a court test last January that established the state's right to compel localities to build sewage-treatment facilities regardless of cost and regardless of the community's ability to pay. All the state has to show is the need for pollution abatement. Just how the state could enforce its right in the face of community refusal to comply remains undemonstrated.

Delaware's 10-year-old water-pollution-control machinery appears to be facing its first court test. The community of Laurel has defeated three sewage-plant bond-issue proposals and okayed one. The affirmative vote was for an issue at 4% interest, but no investors could be found. The last proposal provided for 6% interest. This presumably would have appealed to investors, but the voters turned thumbs down.

Chicago's successful pilot-plant test of the Zimmermann wet-oxidation process of sludge disposal in 1958 is resulting in two full-scale plants. Chicago's Metropolitan Sanitary District signed an $11.9-million contract last year for a 200-ton-a-day (solids weight) Zimmermann plant. Wheeling, W. Va., signed a $284,000 contract for a 5.6-ton-a-day plant.

Performance of the two plants will be particularly interesting to watch because of differences in the size and the character of sludge. Chicago's plant will have four 50-ton-a-day units, which could be part of any big system. Wheeling's will be a single smaller unit, of particular interest to small cities. The Chicago plant will treat a mixture of activated and primary sludge with a solids concentration of 3%. The Wheeling plant will handle primary sludge alone, with 6% solids.

If we can keep the streams clean, the U. S. taken as a whole seems to be in good shape on water quantity for the next few decades. Demands for municipal water and for some industrial and irrigation water will total 419 billion gallons a day by the turn of the century, according to preliminary government estimates. In the mid-1950's it was 140 billion gallons a day. Surface water available for development totals 1,160 billion gallons a day, according to the U. S. Geological Survey.

The good over-all condition may be scant comfort to the water-short areas, however. Accordingly, the search for new sources and for ways to make better use of present sources continues.

(Continued p. 98)

Bonus features

for long life and easy maintenance

Designed for above ground maintenance, Mueller AWWA Improved Hydrants have the bonus features that *count.*

The compression-type main valve and two drain valves positively shut off the flow and drain the barrel after each operation.

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360° rotation of the upper barrel permits proper facing of the breech-locked nozzles. Dry-top design seals all stem threads and bearing surfaces from water in the barrel during operation. A refillable oil reservoir maintains proper lubrication of the stem threads and bearing surfaces.

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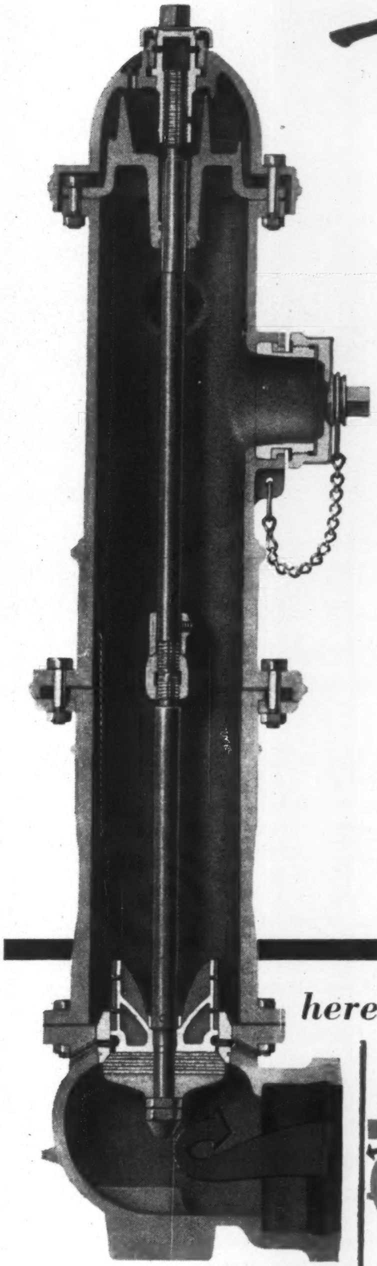
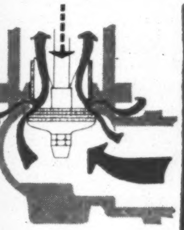
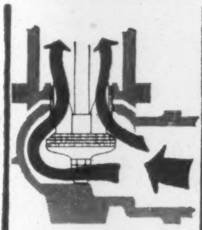
here's how the **MUELLER®** *main valve works:*



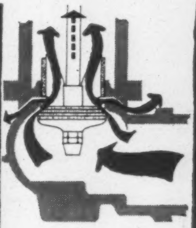
1 Main valve fully closed. Barrel dry.



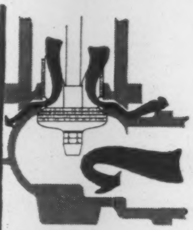
2 Hydrant opening. During first few turns of operating nut, full water pressure flushes drain ports.



3 Hydrant fully opened. Drain ports closed by sealing surfaces on main valve guides.



4 Hydrant closing. Drain ports again force-flushed by full water pressure during last few turns of operating nut.



5 Hydrant fully closed. Water draining from barrel through open ports.

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NEW 1,200-FT MAIN LOCK is top feature of $48-million reconstruction and modernization of Lock and Dam 41, on the Ohio River at Louisville. Also part of the project, Louisville & Portland Canal is being widened from 200 to 500 ft.

This year may see construction in progress on some of the Interior Department's desalinization demonstrator plants. Processes have been picked for four of the five authorized under the federal government's $10-million program and locations generally settled on. The 1-mgd seawater plant on the Gulf Coast will be located at Freeport, Tex. It will use the multiple-effect vertical long-tube distillation process. The 1-mgd Pacific Coast seawater plant will be built in Southern California. It will use the multistage flash evaporation process. Heat may eventually be supplied by a nuclear reactor.

The two 250,000-gpd plants for conversion of brackish water will use the ion-selective membrane and vapor compression methods, respectively. One of these two plants will be located in the Southwest, the other in the Northern Great Plains. Still to be decided on are the process and the location for the fifth plant. However, under terms of the program, it will be a seawater conversion plant and will be located somewhere on the East Coast.

Strong opposition clouds the future of California's great state-sponsored water plan, one of the most ambitious redistribution projects ever undertaken. But there may be a silver lining.

The program moved ahead to some extent last year. Design progressed on the 730-ft-high, 79-million-cu-yd earth and rock fill Oroville Dam, and on the complicated aqueduct system required to carry the water from north to south. California's new governor, Edmund G. Brown, threw his political weight behind the program with the result that $85 million was made available for design work, right-of-way acquisition and construction. Perhaps most important of all, the state government agreed to place before the voters a $1.75-billion bond-issue proposal this fall to finance the program.

The proposal now appears to be in serious trouble on several counts, and it is doubtful that proponents of the measure can swing voters behind it. The biggest complaint is that the legislation does not spell out water-rights guarantees in detail. The Metropolitan Water District of Southern California, one of the chief critics on this point, maintains that title "to the water the state contracts to deliver should be firm so that the water cannot be recaptured at a future time and so that there will be reasonable assurances that the contractors (namely, water distribution agencies like MWD) who supply the funds will receive water."

Other opposition comes on the issue of unjust enrichment of big landowners in the San Joaquin Valley. The leader on this point has been the AFL-CIO California Labor Federation. This group wants an acreage limitation or some other safeguard. The California State Grange has similar views.

Still others object to the bond issue on the basis of financial feasibility. They say the state's credit can't absorb such a huge issue along with all the other issues existing and pending. One outspoken critic is Adolph Ackerman, consulting engineer of Madison, Wis. He declined to sign a consulting board report on the aqueduct system because he doubts that the project as a whole is financially feasible.

On the other hand Alan K. Browne, Bank of America vice president and municipal-bond expert, has predicted that the bonds, if approved by the voters, "can be sold at a reasonable rate if good judgment is used and sales [are] related to the market, the construction schedule, and the sale of other state bonds."

Opposition to the measure is also noticeable in some areas that won't benefit directly. The San Francisco and Oakland areas have with their own funds taken care of their water needs for may years to come. Voters there might insist that other areas do likewise.

To overcome the objections, Governor Brown may gamble that a special session can patch up the bond legislation. The alternative is almost certain defeat of the measure.

It is not too clear what will happen in that case, but there are alternates to the bond issue.

As one alternate the state could attempt to provide money from other sources. This would probably slow the over-all program.

There is also the possibility that the

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A new bigger crawler under the Lorain-50 gives still better footing, a more stable base whether used as an excavator or crane. Always a tough digging machine as shovel or hoe, the new "50" can even better its fast high production performance.

25-ton capacity as crane. The increased crawler size gives increased crane capacities too. 14′ long by 11′ wide, it provides real stability, and Lorain's square-tubular-chord boom is lighter, stronger, gives longer reaches.

More work done with "Joy-Stick" controls. Regardless of the front end used, 2-lever, "Joy-Stick" air controls make it easier for the operator to get increased production. Each lever controls single or combined operations. "Metered air" valves retain normal feel of the machine. There is no easier way to get the job done.

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PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawler mountings from ⅜- to 2½-yard capacity · Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes · Rubber tire front-end Moto-Loaders in 1¾- and 2-yard models.

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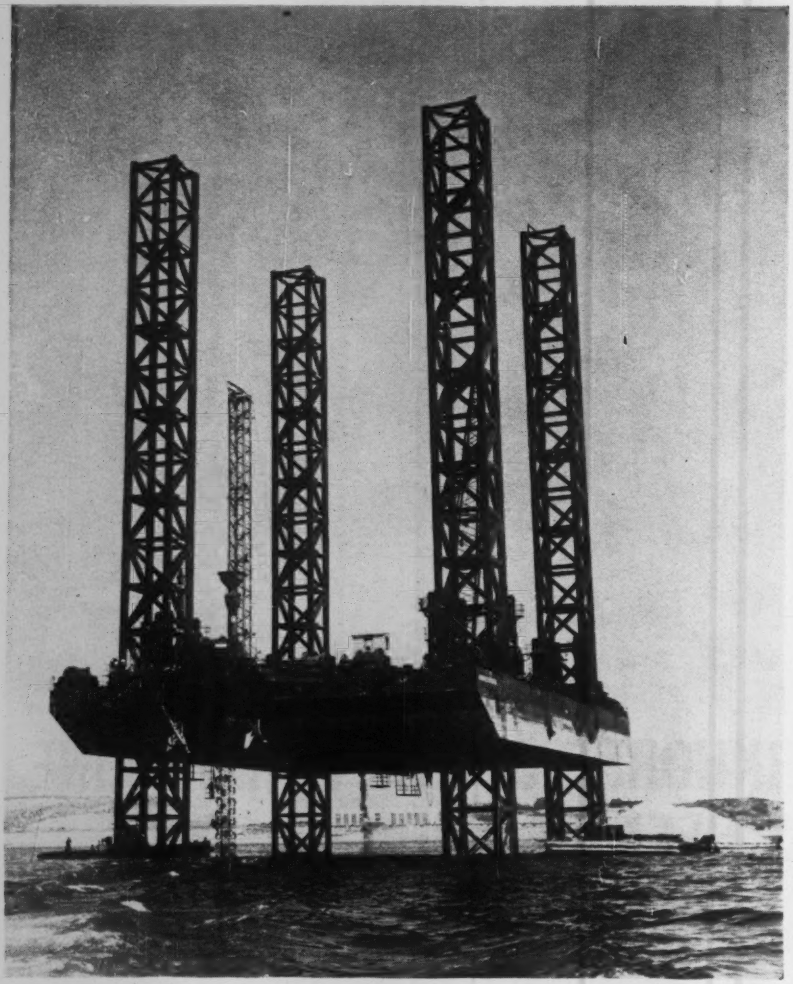

SEAGOING PLATFORM that floats to working position and then extends legs to bottom is laying 5½-mile ocean outfall for Los Angeles' Hyperion Sewage Plant.

federal government might step in and do the job. That happened when California found it could not finance the Central Valley Project during the depression. The U. S. Bureau of Reclamation constructed the works previously planned by the state.

There could also be a federal-state cooperative program. There is a degree of cooperation already. Federal flood-control funds are expected for Oroville Dam, and joint construction is planned for San Luis Reservoir.

As a final possibility, a super-district like the MWD might be formed to include only areas benefited directly.

Super-districts may solve a lot of water problems for areas all over the U. S. Certainly many metropolitan areas consider it a possible answer to problems created by urban sprawl.

A new example is Detroit. The city bought Wayne County's water system last year and hopes eventually to furnish water for five more counties. The centralized control would facilitate development of Lake Huron as a new source for the entire six-county area.

Three pumped-storage hydro plants in the U. S. will figure in 1960 development.

The country's—and probably the world's—biggest is to be built by a Missouri utility. Union Electric Co. of St. Louis awarded the first $20-million contract on a $50-million job with installed generating capacity of 350,000 kw.

The final size of New York State's huge Niagara Power Project depends on a pending Supreme Court decision involving a pumped-storage reservoir. The case centers around the resistance (successful so far) of the Tuscarora Indians to the state's efforts to take tribal land for part of the reservoir.

Appalachian Power Co. appears ready to start work on Smith Mountain Dam, a 285,000-kw pumped-storage project on the Roanoke River in Virginia. The utility took bids on the bigger of two dams in the $45-million project and announced selection of the dam type (rockfill). Further action by the power company awaits issuance of a license by the Federal Power Commission.

A year-end fresh breeze promises to get joint U. S.-Canada development of the Columbia out of the doldrums. The International Joint Commission reached agreement on major points in December and the two governments are expected to start working out a formal agreement in detail soon. Most important item from the U. S. viewpoint is assurance that Canada won't divert Columbia water into the Fraser.

Some unusual construction techniques won new devotees last year.

Vacuum cooling of aggregates was used successfully for the first time on a full-scale basis at the Corps of Engineers' Hartwell Dam, on the Savannah River, along the South Carolina-Georgia border. In warm weather, the plant cools all the sand and coarse aggregates required. The same steam-jet-vacuum process was used on a smaller scale at Charlotteberg Dam, part of the Newark, N. J., water supply system.

Cooling was the unusual key item also in a shaft-sinking job in New York City. To stabilize the excavation and keep it dry without running the risk of lowering the water table, the contractor froze a cylinder of earth about 36 ft in diameter and 123 ft deep, extending into bedrock. He then sank the 14½-ft-dia shaft through the frozen earth, concreting in increments as the excavation progressed.

Another out-of-the-ordinary method of stabilizing an excavation is getting a big-scale workout at Wanapum Dam on the Columbia River. As excavation proceeds for the cut-off wall, the trench is kept filled with a slurry of bentonite clay and water. No sheet piling or other bank stabilization is needed. Concrete pumped in later displaces the slurry.

A contractor in Houston claims success in driving a 10-ft sewer tunnel through relatively soft earth with a shield that has a toothed cutting chain mounted on the front. Spoil is mixed with water at the cutting face and pumped to a disposal area outside the tunnel.

Continuous in-place pipe forming techniques for both plastic and concrete are claimed. Inner forms are inflatable.

A Delaware contractor stripped the guns off a surplus army tank, waterproofed it so it could operate in nine feet of water and fitted it with a boom. Then he put it to work on a groin construction job, saving the cost of inching out from shore on a work deck.

HALLIBURTON *Pressure Grouting* SERVICE

offers complete equipment, men and materials for any size grouting job . . .

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A DIVISION OF HALLIBURTON
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The Halliburton Method of Pressure Grouting dating back to 1930, has attained an outstanding performance record due to a constant scientific research and development program in the field of grouting techniques. Through improved grouting methods, Halliburton has pressure-grouted many million sacks of portland cement and special grouting chemicals.

Halliburton's successful grouting record is due to its experienced grouting engineering service personnel and the latest scientific grouting developments within its own technical, development laboratory.

SOME EXCLUSIVE PRESSURE GROUTING SERVICE FEATURES OFFERED ARE:

- A dependable and convenient method of metering, mixing and placing grouting materials — continuously.
- A Grouting Pump Assembly . . . consists of skid mounted pump units incorporating all the pump equipment, calibrated tanks, manifolding, pressure gauge, pressure recorder, hoses and mixing jet gun.
- Pump Unit is either air motor or diesel engine driven . . . to conform with the availability of compressed air on the job site.
- Power Units are demountable in order to reduce size and weight of component parts for easier handling and transporting in such areas as restricted mine passages and shafts.
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- A great number of additives and water control agents for the improvement and modification of basic grouting materials are available.

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DAMS . . . **Municipal dam repairs** . . . sealing foundation leaks
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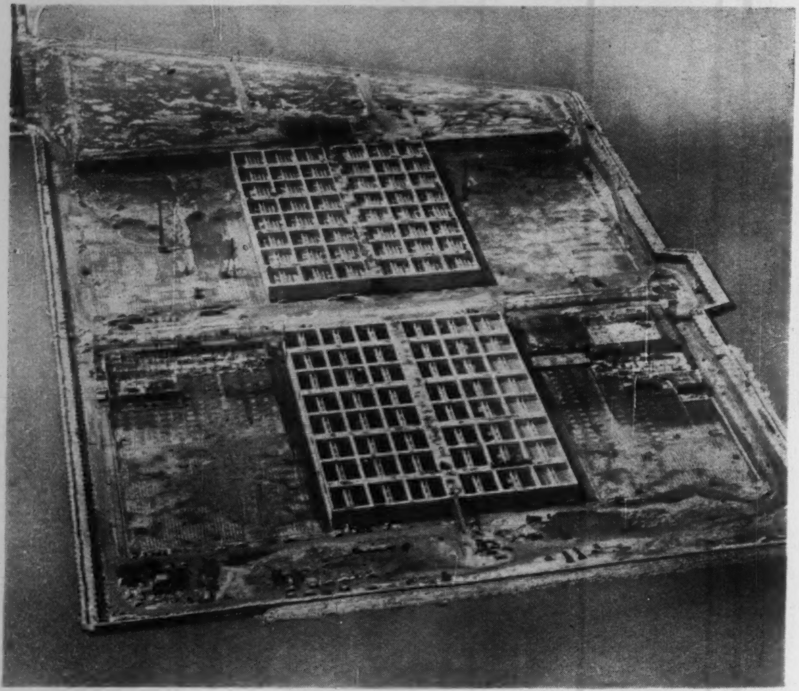
For additional detailed information and "job experience" data about this successful service, contact the nearest Halliburton Pressure Grouting Division Office or the General Offices in Duncan, Oklahoma.

Write for your copy of the new "Halliburton Pressure Grouting Service" Brochure No. PGS-0002.

Major Water Supply and Sanitation Projects



© Aerial Photograph Co.

CHICAGO FILTER PLANT will have a rated capacity of 960 mgd and a hydraulic capacity of 1,700 mgd when completed in 1961 at a cost of $100 million.

New England

• **Boston** (water)—Metropolitan District Commission's Clinton-to-Marlborough tunnel is 15% complete. The eight-mile shaft is the first link of a pressure aqueduct connecting Wachusett Reservoir to the metropolitan system at Marlborough. Cost: $16.9 million.

• **Boston** (sewerage)—Final phase of the city's $100-million metropolitan sewerage system, the Deer Island Pumping Station, is nearly ready for installation of pumping equipment. The plant required a 109-ft-dia caisson, 90 ft deep.

• **Providence, R. I.** (water)—An underground reservoir to boost the city's storage capacity to 92 million gal is due for an early start in 1960. The 400 x 600 ft structure will have a 40-million-gal capacity, cost over $2 million.

Middle Atlantic

• **Baltimore** (water)—The initial section of metropolitan Baltimore's Susquehanna River project, 30,000 ft of 96-in. pipeline, has been completed. The $45.-million system represents a third major water-supply source for the area.

• **Buffalo** (water)—A purification and pumping station at Sturgeon Point, on Lake Erie, is 80% complete.

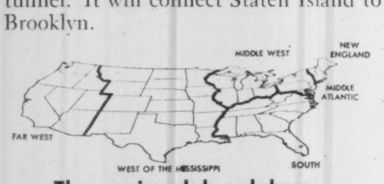
• **Harrisburg** (sewerage) — Harrisburg Sewage Authority reports completion of a sewage treatment plant that will serve the city and several neighboring communities. The collection system, a pumping station and force mains, are 85% complete. Cost: $5.5 million.

• **Nassau County, N. Y.** (sewerage)—Six contracts totaling $13 million were awarded for lateral sewers during 1959.

• **New York City** (water)—Excavation work was completed in January on the 44-mile West Delaware Tunnel. Two-thirds of the aqueduct have been concrete lined.

Diversion of the West Branch of the Delaware River has been substantially completed in preparation for Cannonsville Dam and Reservoir. Contracts for construction of the dam and intake and outlet works for the tunnel will be let this year.

Test borings were begun for what will be New York City's third water tunnel. It will connect Staten Island to Brooklyn.



The regional breakdown.

• **New York City** (sewerage)—Sewerage construction accounted for $15.5 million in Department of Public Work's budget for 1959. The second phase of the $300-million pollution control program, highlighted by the Newtown Creek project, has progressed steadily.

The $10-million Morgan Ave. Interceptor was completed and the Kent Ave., intercepting sewer, with $12.2 million in contracts let, should be substantially complete by the end of this year. Early in 1959, work began on a $6.4-million East River force main.

Expansion of the Rockaway and Coney Island plants now underway will increase their combined capacity to 140 mgd. A $2.9-million outfall was completed in the spring. Allocations of $19.6 million are slated for expansion of Jamaica and Wards Island plants.

Award of a $5.5-million contract for construction of storm sewers in the Borough of Queens was announced.

• **Philadelphia** (water) — Construction contracts completed for water plants and pipeline totaled $16.6 million during 1959 and $5.8 million in new contracts were let.

The 282-mgd Torresdale filtration plant began operation in October at a cost of $25 million. Last stages of Queen Lane treatment plant, the rapid sand filters, were 87% finished at year's end. Reconstruction of Belmont filter plant showed 58% completion of the raw water pumping station.

• **Philadelphia** (sewerage)—First section of Wakeling Street relief sewer was started in October. Limit of this contract is $1.5 million with a $2-million second contract to be let this fall. The 13-ft-dia main relief tunnel is scheduled for completion in March.

• **Pittsburgh** (sewerage) — Allegheny County Sanitary Authority began operation of its unique new Woods Run treatment plant with 70 miles of interceptors. The $100-million system includes 33 miles of deep tunnel interceptors and an incinerator that burns undigested sludge.

• **Trenton** (sewerage)—A municipal sewage treatment plant costing $3.8 million was 20% finished in 1959. Completion is scheduled for spring, 1960.

• **Washington, D. C.** (water)—Corps of Engineers' $60-million, long-range water supply program for District of Columbia and metropolitan Washington is 65% complete. Major project is Little Falls Dam and Pumping Station on the Potomac River. Also progressing is the Dalecarlia high-lift pumping station. Biggest contract letting in 1960

Delta Construction Co. underbids competition on $350,000 in contracts . . . gives credit to extra speed, power and maneuverability of

5 CASE®

TERRAMATIC® DRIVE

CRAWLERS

1000
TERRAMATIC DRIVE
CASE

CERTIFIED
FLEET OWNER REPORT

Turn the page for more details →

C. L. NORRIS, Delta Construction Co., reports:

"We cut overall dirtmoving costs 35% by CASE® TERRAMATIC® DRIVE

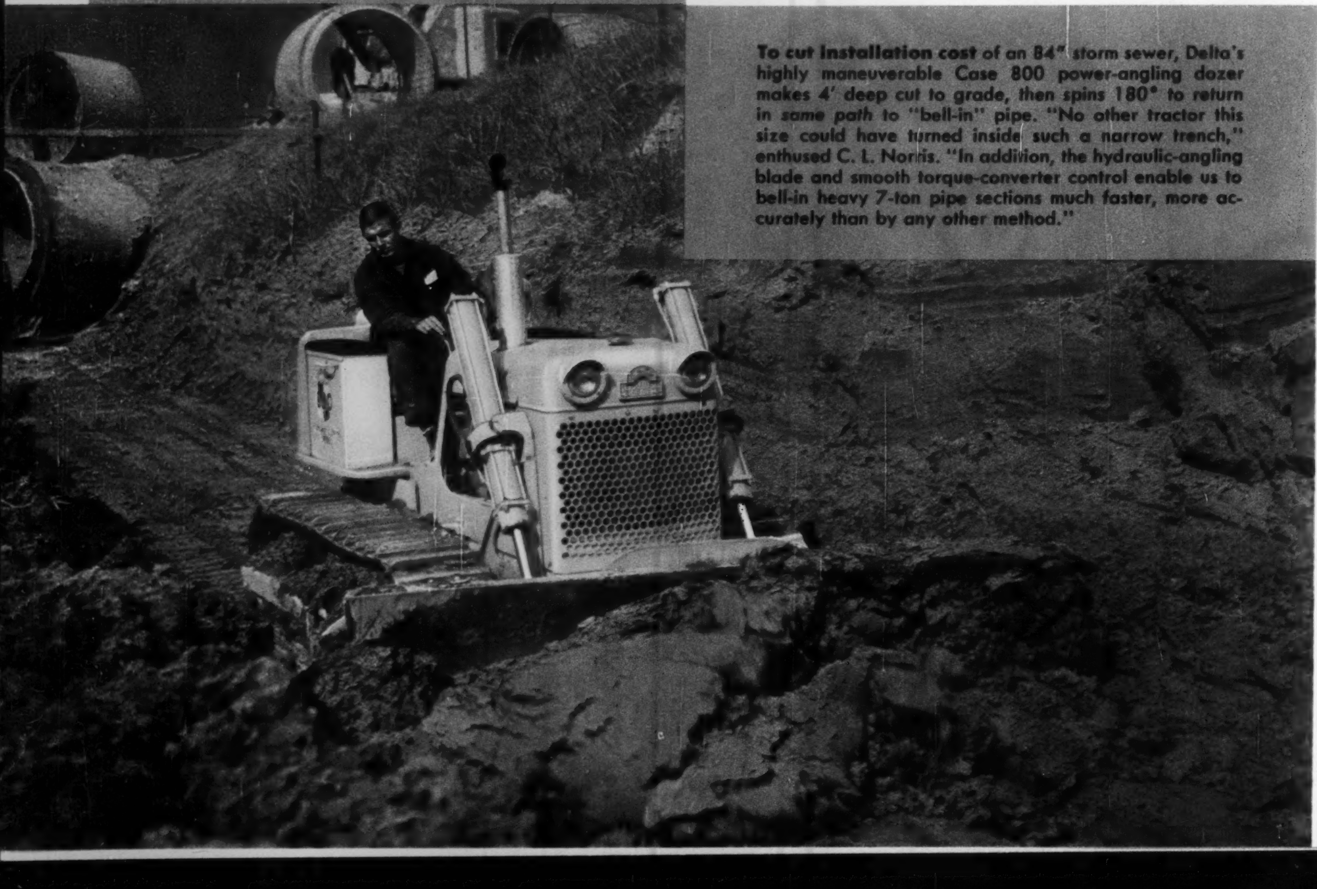
C. L. Norris (second from right) and sons — Virgil (right), and C. W. (left) — check specifications of new Case machine with Chester Johnson, Sales Engineer for Case Dealer — Southland Tractors, Inc., Memphis, Tenn. Jim Norris, third son in the Delta partnership, was in another part of the city, supervising storm sewer job shown below, when this picture was taken.

"The extra power and working-speed of Case tractors permits them to almost double the output of any crawler near their size or price!"

C. L. NORRIS, and his three sons — who operate as equal partners in Delta Construction Co., Memphis, Tenn. — have *owned or operated all leading makes of crawler tractors.* Mr. Norris pointed out, "It wasn't until we made-the-break to Case Terramatic Drive that we started making real money."

Mr. Norris goes on to explain, "With Terramatic Drive crawlers, we've been able to cut overall dozing and truck-loading costs as much as 35%. This has permitted us to underbid all competition on *every* job we've gone after — handle more jobs per year — and still come out with a *profit.*"

Delta's operators agree that the combination of *automatic torque converter and constant-mesh, power-shift Terramatic transmission* beats anything they've seen for speed and easy-handling on the job. Typical



To cut installation cost of an 84" storm sewer, Delta's highly maneuverable Case 800 power-angling dozer makes 4' deep cut to grade, then spins 180° to return in *same path* to "bell-in" pipe. "No other tractor this size could have turned inside such a narrow trench," enthused C. L. Norris. "In addition, the hydraulic-angling blade and smooth torque-converter control enable us to bell-in heavy 7-ton pipe sections much faster, more accurately than by any other method."

making-the-break to CRAWLERS"

operator comment: "These Case rigs shift by themselves (no clutching) . . . never stall . . . and we can power-turn 'em on a dime with those counter-rotating tracks. We load trucks on the fly without stopping."

147,000-yd. contract completed 60 days ahead of schedule. In addition to handling numerous other important jobs, Delta's "*Case tractor-fleet*" recently completed "Project Tenn. 1-12", involving 125,000 cu. yds. of earth and 22,000 cu. yds. of concrete work, *60 days ahead of the Housing Authority's estimate.* C. L. Norris adds proudly, "We'd never have been able to do it with conventional clutch-type crawlers. The higher-speed Case Terramatic rigs performed beyond our expectations, and we are happy to report that *service from our Case Industrial Dealer — Southland Tractors, Inc. — has been first rate on all counts.*"

CHECK LIST OF DELTA'S EQUIPMENT SPREAD

2 CASE Model 1000 tractor-shovels
1 CASE Model 1000 Power-Tilt Dozer
1 CASE Model 800 Power-Tilt Dozer
1 CASE Model 800 Power-Angling Dozer
1 CASE Model 420 Backhoe-Loader (Wheel)
1 Competitive make 2-yd. tractor-shovel*
1 ½-yd. self-propelled dragline
13 Dump trucks (6 to 8-yd. cap.)
5 Pick-up trucks

*Used without a bucket — primarily for pulling sheepsfoot roller.

MAJOR 1959 DELTA CONTRACTS

(Total: over $350,000)

1. Clearing, filling, grading, trenching and footings for Project Tenn. 1-12 — 300-family low-rent housing project for Memphis Housing Authority.
2. Site preparation for Memphis Medical Center addition (10,000 cu. yds.).
3. Site preparation for large trailer court (20,000 cu. yds.).
4. Installing 1000' of 84" storm sewer for City of Memphis.
5. Cutting 5 blocks of city street to grade and excavating for curbs and gutters.
6. Trenching for 6000' sanitary sewer.
7. 15 city blocks of grading for other contractors.

Loading 5 cu. yds. per minute is "duck soup" for the 2-yd. Case 1000 tractor-shovel, according to Delta. They also have high praise for their low-cost Case 420 *wheel-mounted backhoe-loader* (in background). It dug 17,000 lineal ft. of footings and pipe trenches on Project Tenn. 1-12 at *a saving of $50 a day* over a larger rig they previously planned to use. The "420" easily kept ahead of pipe and concrete crews . . . *lost only 1 day in 4 months* (for inspection and tuning).

Find out for yourself! A comparative Work-Test will prove it makes sense to make-the-break to CASE →

CASE®
TERRAMATIC® DRIVE

- ***Speeds up crawler work-cycles***
- ***Eliminates*** **clutching and shifting**
- ***Cuts*** **operator fatigue for more output per shift**

Call your CASE Dealer for a demonstration

When successful contractors, like Delta Construction Co., Memphis, Tenn., suddenly *switch* to Case Terramatic Drive crawlers — and buy them in *"fleets"* — they must have sound *dollars and cents reasons.* See for yourself on your own job. Make a demonstration date today, and *compare* the profit-making difference!

Don't worry about cash!

Your Case Industrial Dealer will gladly arrange an easy monthly financing or lease plan, with seasonal "skip-payments" to fit your requirements. Mail coupon for complete facts.

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World-wide Sales and Service

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Dept. A1410, Racine, Wis., U.S.A.

Yes, I'm interested in a proof-demonstration of a Case Terramatic Drive crawler with:

☐ Tractor-Shovel ☐ Tilt-Dozer ☐ Power-Angling Dozer

Also send literature on: ☐ Model 600 .... (Equipment)

☐ 420 Crawler .... (Equipment) ☐ 420 Wheel Backhoe-Loader

☐ M-420 Fork Lift ☐ W-5 ☐ W-9 ☐ W-10 ☐ W-12

Name .... Title ....

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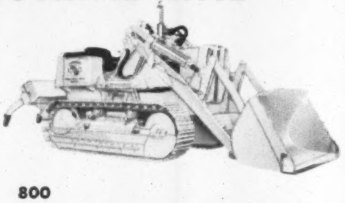
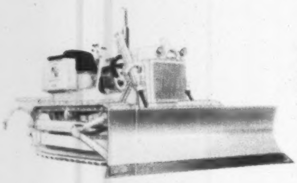
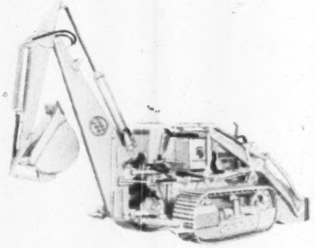
Check the complete CASE INDUSTRIAL LINE



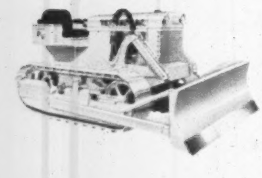
1000
100 hp* diesel engine. Case Terramatic Drive. Torsion-bar track suspension.



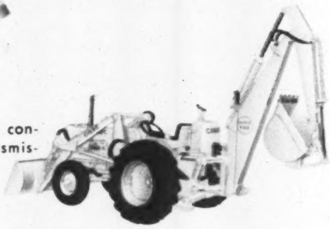
800
80 hp* diesel engine. Case Terramatic Drive. Torsion-bar track suspension.



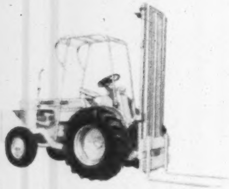
600
62 hp* diesel or gas, with torque converter, 4-speed hydraulic power-shift transmission and power-steering.



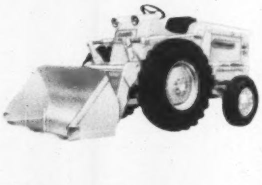
420 Crawler
42 hp* gasoline engine. Ferrometallic clutch: 3-speed gear transmission. Improved total-contact differential steering.



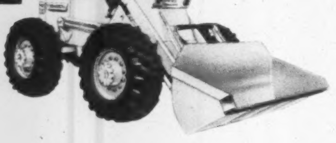
420 Wheel
47 hp* gasoline engine. Torque converter, 8-speed shuttle-shift transmission. Hydraulic power-steering.



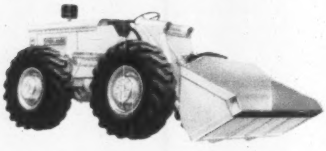
M-420
4000-lb. capacity wheel fork lift. 9½', 14'3" or 21'6" mast. 47 hp* gas engine. Torque converter. 8-speed shuttle transmission. Hydraulic power-steer.



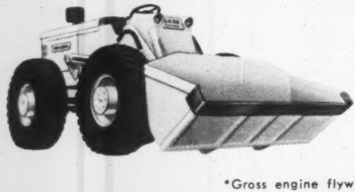
W-5 Terraload'r®
3000-lb. capacity, front-wheel-drive, rear-wheel power-steer. 1 or 1½-cu. yd. bucket. Torque-converter drive. Power shift.



W-9 Terraload'r
5500-lb. capacity, 4-wheel-drive, rear-wheel power-steer. 1¼, 1¾ or 2¾-cu. yd. bucket. Gas or diesel engine. Torque converter. Power-shift transmission.



W-10 Terraload'r
6500-lb. capacity, 4-wheel-drive, rear-wheel power-steer. 1¼, 2 or 3½-cu. yd. bucket. 401-cu. in. diesel engine, torque converter, power shift.



W-12 Terraload'r
9000-lb. capacity. 4-wheel-drive, rear-wheel power-steer. 1⅝, 2½ or 3½-cu. yd. bucket. 451-cu. in. diesel engine, torque converter, power shift.

*Gross engine flywheel HP. Sea level (calculated) max. HP (based on 60° F and 29.92" hg.). Mfr's rating.

will be the Dalecarlia filtration and chemical building.

Maryland suburbs of the capital will be supplied with drinking water from the Potomac River on completion of the Watts Branch filtration plant, now 30% done. The $12-million system includes nearly $6 million in pipeline construction – $1.5 million to be awarded this year.

• Washington, D. C. (sewerage)—Secondary treatment additions to the District's sewage treatment system are 90% complete at a cost of $12.5 million. Designed capacity of 290 mgd is expected to suffice until 1980.

On completion of Gaithersburg extension of Rock Creek trunk sewer, Washington Suburban Sanitary District will begin treatment of all sewage from Maryland suburbs in the Potomac watershed.

• Yonkers, N. Y. (sewerage)—Launching of a 1,600-ton-capacity sludge barge signaled the imminent completion and commencement of operations of the $15-million Westchester Joint Treatment Plant early this year.

South

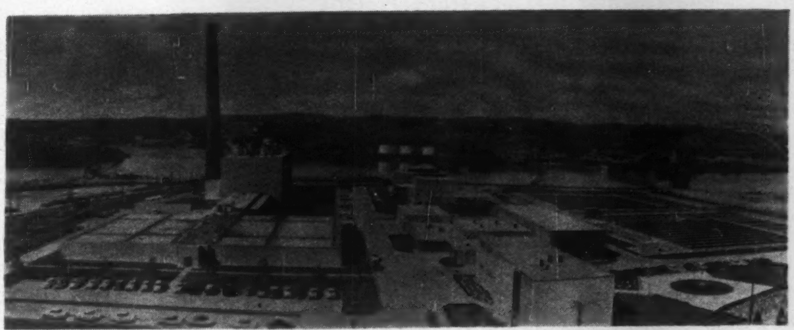
• Birmingham (water)—Industrial Water Board reports 25% completion of $22.8-million industrial water system. Steel shortages held up starts on transmission lines and surge tanks but $13.2 million in contracts were awarded.

• Fairfax County, Va. (water)—Fairfax County Water Authority plans a March start on a $4.6-million water supply system for the northerly area. It will consist of a million-gallon standpipe, two pumping stations and 24 miles of transmission mains.

A $3-million project, the Annandale Water System, got moving last January and is now 65% complete. Half the cost of this new system went for acquisition of an existing water system. Additions included a pumping station and elevated storage tank.

• Fairfax County, Va. (sewerage)—Pimmit Run-Chain Bridge trunk sewer represents the first Virginia-D.C. interjurisdictional waste disposal project. Sewer extension and pumping station will serve the capitol's adjacent suburban areas across the Potomac in Virginia. Project should be completed by late 1960.

• Jacksonville, Fla. (sewerage)—a sewage treatment plant started early in 1958 is 40% complete. The project has a capacity of 17.5 mgd and will cost $15 million.



PITTSBURGH TREATMENT PLANT was put into service last year. Part of a $100-million system, the unit features an incinerator that burns undigested sludge.

• Louisville (sewerage)—Louisville and Jefferson County Metropolitan Sewer District reports completion in 1959 of $5.4 million worth of interceptors and major sewers. A 104-mgd pumping station is 95% complete. These projects represent considerable headway on the $10-million interceptor system that will ultimately feed into the district's recently completed Fort Southworth treatment plant.

Middle West

• Akron (water)—Bridge Creek Reservoir and Dam, begun in 1958, is scheduled for completion this year. Project cost: $2 million.

• Chicago (water)—At year's end, the 960-mgd Central District filtration plant was 54% completed. Total construction under contract is $58 million with about $28 million worth to be awarded in 1960. The $100-million plant is scheduled for 1961 completion.

Plans have been prepared for increasing by 50% the 320-mgd capacity of South District filtration plant at a cost of $5.6 million.

The city will spend $8.5 million this year on modernization of 10 pumping stations and construction of a 175-mgd unit at 84th and S. Keeler Ave.

DPW reports completion last year of the $5-million 79th St. water tunnel connecting the South District filtration plant with the State St. and Stewart Ave. tunnels. This year about $8.6 million worth of new water tunnels will be constructed.

• Chicago (sewerage) – Metropolitan Sanitary District of Greater Chicago awarded $24.7 million worth of contracts for construction of sewage works, pumping stations and sewers last year. About 75% of this construction was completed. Over $6 million for sewage treatment works and sewerage is expected to be awarded during 1960.

Chicago DPW built 13 miles of new sewers last year costing $8.8 million. Fourteen miles of sewers will be placed under contract this year at an estimated cost of $11.8 million.

Largest single item placed under contract last year was $11.9 million for a sludge disposal plant of the Zimmermann wet-oxidation type at West-Southwest treatment works. About $3 million worth of additional contracts for this development will be awarded this year. This will be the first full-scale plant of this type in the country.

• Cincinnati (water)—An Ohio River intake tunnel and raw water pumping station are nearing completion. The $5.5-million project was started in summer of 1958.

• Cincinnati (sewerage) – Mill Creek sewage treatment plant, 120-mgd capacity, was completed and operating in December 1959. Intercepting sewers are included in the $25-million outlay.

Started in mid-1958, Muddy Creek sewage treatment plant is scheduled for completion in early 1960. The $4.1-million project includes interceptors and has a capacity of 7 mgd.

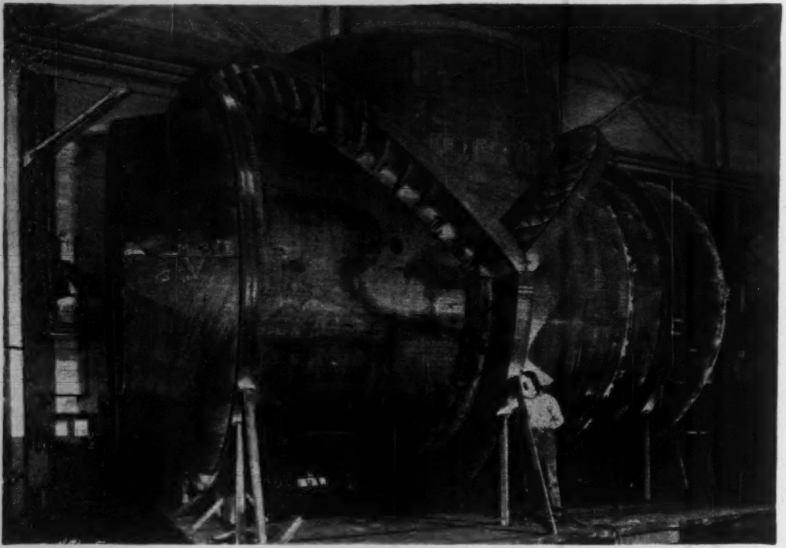
• Detroit (water)—City water department reports nearly $21 million in work under contract in 1959. The Springwell Station filter building costing $10 million was completed and a filtered water reservoir at Springwell is scheduled for May completion.

Water pipeline construction totaling $2.7 million is now under way.

• Detroit (sewerage) – Projects completed in 1959 include the $3.6 million Livernois Extension sewer and the East Seven Mile sewer, a $2.7-million job.

Algonquin outlet relief sewer is roughly half done with 1960 completion planned. Woodmere pumping station and relief sewer also will be completed this year. The 7.9-million Ashland sewer will be completed in 1961.

Detroit's extensive storm relief system involving a $174-million outlay is due for 1975 completion. DPW is



GIANT PIPE section is part of a 14-ft-dia header being installed at a booster pumping station in Detroit that will have a 250 mgd capacity.

presently operating on a three-year, $30 million allocation that runs out in January 1961.

• **Euclid, Ohio** (sewerage)—A new sewage treatment plant, intercepting sewer and outfall into Lake Erie is slated for completion late this year. Estimated cost: $5.1 million.

• **Mahoning Valley Sanitary District, Ohio** (water) — A $3.3-million water pumping station and supply line from Berlin Reservoir was completed.

• **Mansfield, Ohio** (sewerage)—Started in January 1958, the city's $8.3-million sewage treatment plant and intercepting sewers should be completed by summer 1960.

• **Milwaukee** (sewerage)—Road construction, sewers and revetments are the initial physical signs of what will be a $51-million program to provide the city with adequate sewerage facilities through the year 2000. This year, $10 million in work on both old and new plants and sewers will go up for bids.

• **Sandusky, Ohio** (sewerage)—A $5.4-million sewage treatment plant was placed in operation in December.

• **Warren, Ohio** (sewerage)—Summer of 1960 is completion target for this city's new sewage treatment plant costing close to $8 million.

• **Youngstown** (sewerage)—A contract for $5.5 million was awarded by the city late in 1959 for construction of a sewage treatment plant.

• **Zanesville, Ohio** (sewerage)—Started in the spring of 1958, a $3.5-million sewage treatment plant was completed and placed in service last October.

West of Mississippi

• **Dallas (water)** — The $2.3-million Lake June Reservoir and pumping station are progressing with reservoir 50% finished and contract for the pump house to be let this month.

The 25-million gal South Cliff Reservoir was completed and the adjoining pump station begun last year.

First stage of a 30,000-ft, 60-in. concrete water main got under way in 1959.

The Iron Bridge Reservoir and Dam is 85% complete with a pumping station 10% done. This raw water pumping station will supply East Side filtration plant with Sabine River water.

• **Denver** (water)—Construction of Blue River diversion tunnel, the first phase of Dillon Dam, will begin this summer. Bids were received last October for construction of the dam by three alternate designs. Denver Board of Water Commissioners has until May 2 to decide which alternate to build.

Excavation of the 23.3-mile Harold D. Roberts Tunnel was 96% complete at year's end. The 8.5-mile western section was holed through January 2. Concrete lining will be started in June. The $50-million project will deliver Blue River water beneath the Continental Divide to Denver metropolitan area on the eastern slope.

• **Minneapolis-St. Paul** (sewerage) — Roseville, a St. Paul suburb, has an $8-million sanitary sewer system about 80% finished. Started in early 1955, the project will tie this city into the Minneapolis-St. Paul Sanitary District sewage disposal system.

• **St. Paul** (water)—City water department's $21.5 million expansion and improvement is about 70% finished. Completed last year were an 8.5-mile, 60-in. raw water supply line costing $2.6 million and a 10-million gal reservoir.

• **St. Louis** (water)—An improvement program costing $30 million is moving ahead rapidly. Chain of Rocks water plant, upriver from the city, is being modernized. A $2.9-million pumping station at Chain of Rocks is 90%.

This modernization also involves a filtered water basin which was completed last year and a $3.6-million welded steel pipeline about 80% finished.

St. Louis County Water Co. will add another 20 mgd to its South County plant capacity on completion of a $1-million addition slated for mid-1960.

• **St. Louis** (sewerage)—Metropolitan St. Louis Sewer District reports $1.5 million in small sewerage construction under contract or complete in 1959. This year calls for another $3 million in similar storm and sanitary sewerage work to get under way.

The district also expects to start two major sanitary and two storm water projects totaling over $14 million.

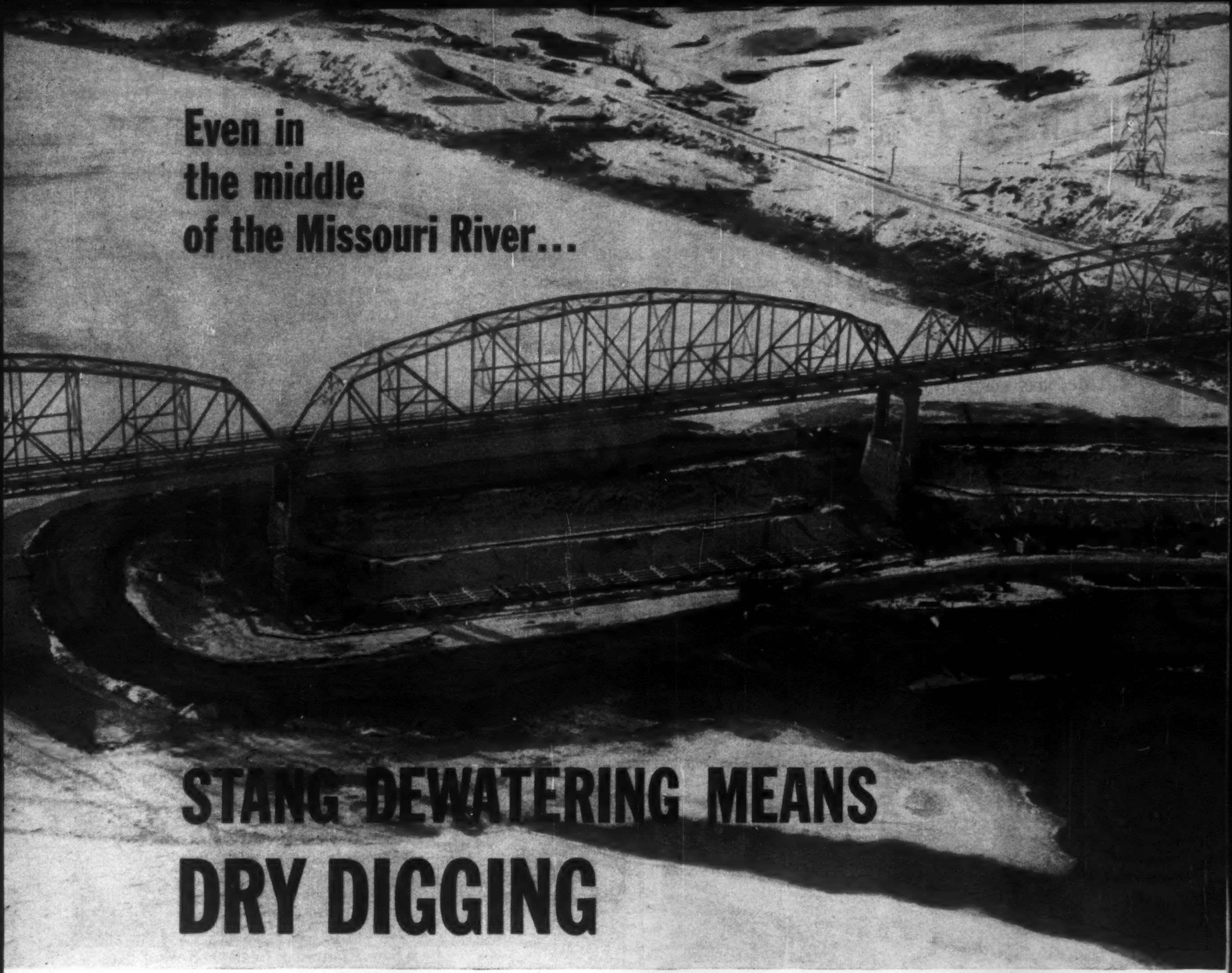
Far West

• **Boise, Idaho** (sewerage)—Construction got under way in November on Boise's Bench Sewer System. The $4.5-million job will consist of 96 miles of pipeline and two new treatment tanks at Boise treatment plant. Completion date: August 1961.

• **East Bay Municipal Utility District** (water)—Steel shortages delayed the $15-million first phase of Mokelumne Aqueduct #3. Tunneling was started on 9-ft-dia Lafayette Water Tunnel to cost $5.5 million. Contract awards in 1960 will total $23.5 million for second and third phases of the aqueduct that will ultimately supply 171 mgd of Sierra water to EBMUD.

Contract will be let this spring for construction of the $14-million Briones Reservoir and Dam. Land clearing has begun already for the 272-ft earthfill structure.

• **Southern California** (water)—Metropolitan Water District of Southern California spent $23 million on construction last year and has $31.6 mil-



700 feet in length and excavated to 23 feet below the surface of the river, the excavation for water intake lines shown above is workably dry—effectively dewatered by a single stage Stang wellpoint system. In spite of sub-zero temperatures, frequent snow falls and a record seasonal high level for the mighty Missouri, the job is progressing at a pace that has put the contractor ahead of schedule and will keep him there. This is the kind of sound engineering, dependable equipment performance and economical water control that typifies a Stang job. Remember: job site water problems are special—and *Stang people are water specialists.* Anywhere, anytime, any weather—if it's a water problem, it will pay you to call Stang.

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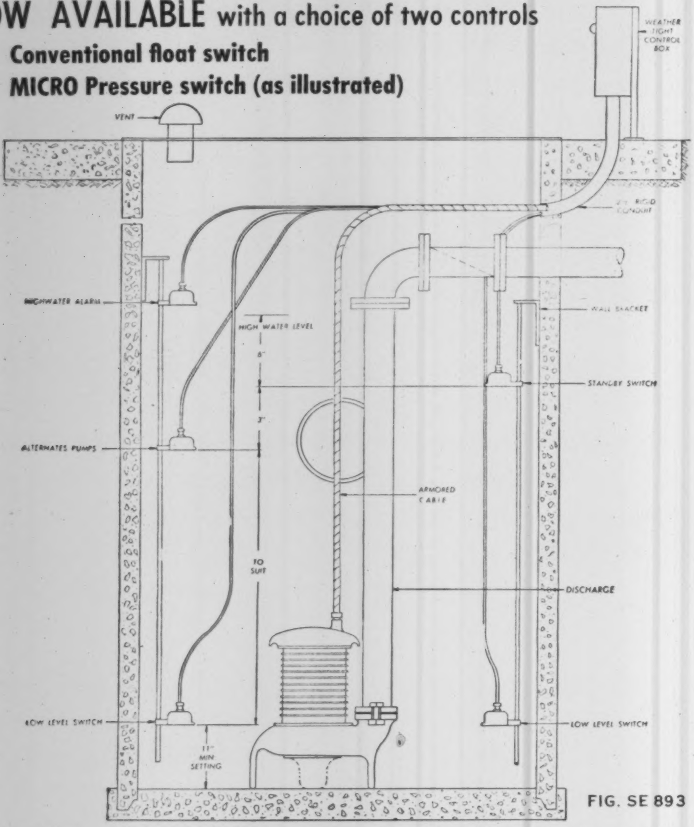

FIG. SE 893

Illustrated is a Duplex Installation of two **weil** Submersible Sewage Pumps employing MICRO Switch controls to start and stop pumps; to alternate pumps; and to provide for high water alarm. Note the ease with which switches are positioned (or changed) to control water levels. The Submersible MICRO Switch has no exposed moving parts, needs no servicing and coupled with the **weil** Submersible Pump provides an extremely efficient non-clog trouble-free pumping system.

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lion budgeted for new projects in 1960.

Main line of Colorado River Aqueduct is reported to be completed and capable of full capacity operation. Enlargement of Lake Mathews, the terminal reservoir, is progressing and is scheduled for late 1960 completion at a cost of $9 million.

- **Los Angeles** (sewerage)—The 12-ft-dia Hyperion ocean outfall is 95% finished as the $60-million sewerage expansion program moves closer to over-all completion this year. Hyperion's 6½-mile effluent outfall is the largest undersea pipe ever laid.

- **Salt Lake City** (water)—Salt Lake Metropolitan Water District reports 95% completion of its $7.5-million Little Cottonwood Filtration plant.

- **San Diego** (water)—Miramar Dam, an earthfill structure, and excavation for a 50-mgd filtration plant was started in October. Estimated $3-million construction contract for the plant to be awarded in May 1960. Miramar Reservoir will impound 7,000 acre-ft.

  San Diego County Water Authority reports 65-mile Second San Diego Aqueduct 66% complete at year's end.

- **San Diego** (sewerage)—Voters will decide in November on a revenue bond issue that will enable the city to start the $43-million Point Loma sewage treatment plant, an intercepting sewer and a 13,000-ft ocean outfall.

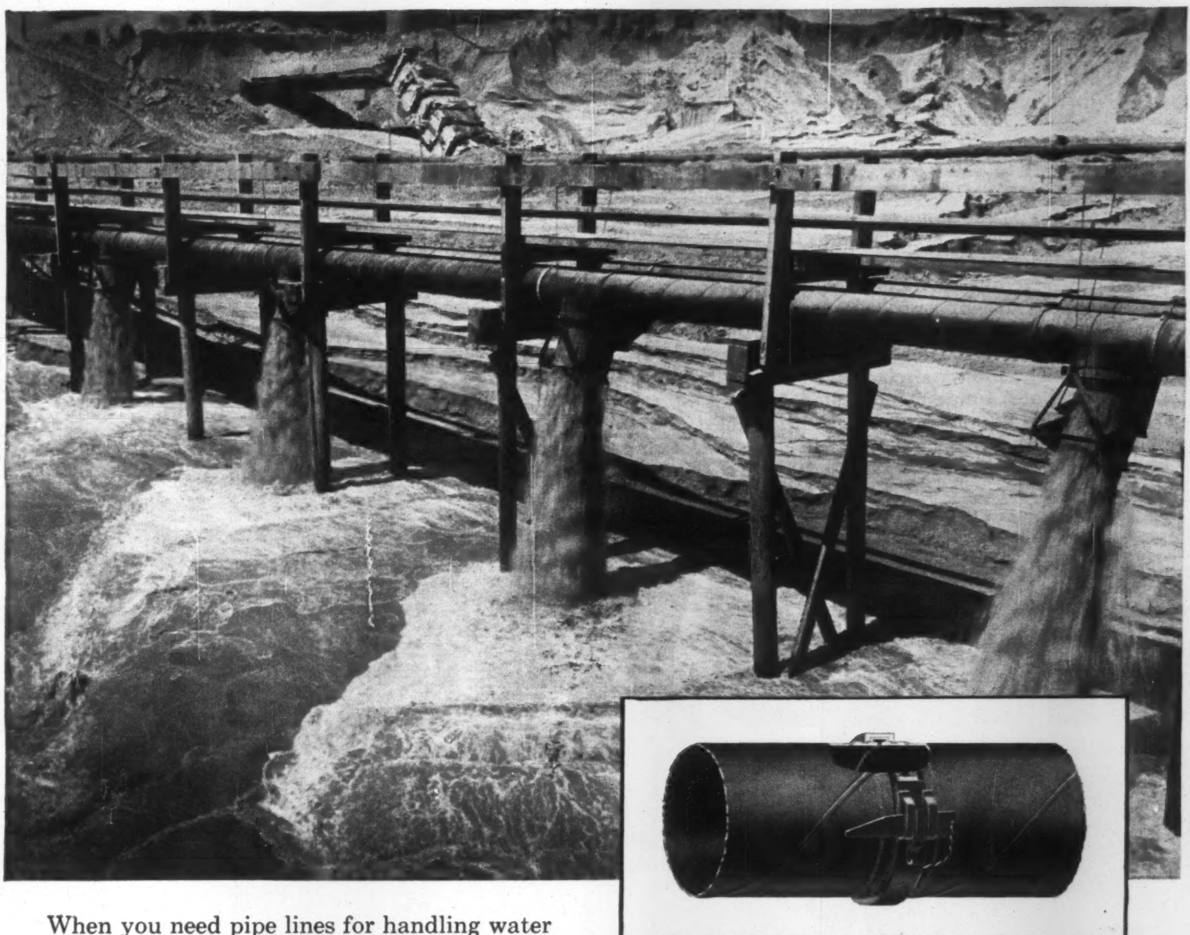
- **San Francisco** (water)—Sunset Reservoir, owned jointly by the City and County of San Francisco, is 98% complete. Begun in May 1958, the $2.8-million project has a capacity of 87.3 million gal.

- **Seattle** (sewerage)—A $2-million repair job involving replacement of 244 ft of 72-in. North Trunk sewer destroyed by a cave-in was completed in October. Also included in this king-sized sewer repair was installation of steel lining in 3,500 ft of existing sewer.

- **Hawaii** (water)—The island state reports 35% completion on the $8.2-million Molokai Irrigation Project. Better than 21,000 ft of a 27,000-ft tunnel is done.

  Hawaii Water Authority completed three wells as part of $2.8-million water supply system for Kona, an area that, until recently, relied principally on rain water storage. A $1.2-million program to develop a water supply system for rural Oahe is 33% complete. Four wells have been drilled and a 4-million gal reservoir planned for a 1960 start.

GETS THE JOB DONE!



The NAYLOR Heavy-duty Wedgelock coupling makes a positive connection—securely anchored in standard weight grooved ends. A hammer is the only tool required to connect or disconnect it. Low-pressure type also available.

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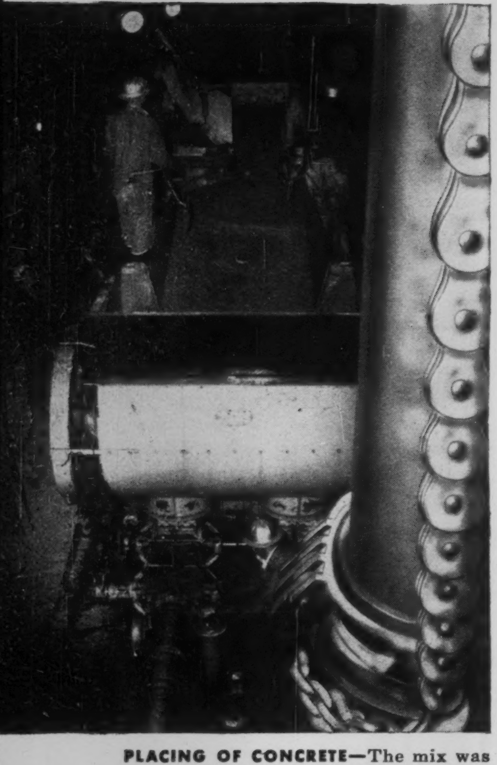
CONCRETE PERFORMANCE REPORT:

POZZOLITH helps Norfolk and Western Railway Company speed tunnel concreting operation and assure maximum durability on 8270-foot tunnel project.

SANDY RIDGE

Sandy Ridge Tunnel—recently completed Norfolk and Western Railway Company project near Carbo, Virginia —is described as the longest railroad tunnel in Virginia or West Virginia.

Constructed to serve new coal mine properties developed by Clinchfield Coal Company, Division of The Pittston Company, the arch-type tunnel represents the major part of a $7 million investment. The project also included the building of 6.3 miles of main line railroad and about 9 miles of spur and operation tracks. A concrete highway bridge and a concrete underpass were built to effect grade separation between the railroad and a highway.



PLACING OF CONCRETE—The mix was pumped to the top of 27-foot high forms through 6-inch slick lines (foreground), then vibrated into place. POZZOLITH helped provide the exceptional workability required for this type of operation.

Sandy Ridge Tunnel was constructed from both ends, and, when the tunnel bore had been completed, the concrete floor and ballast walls were poured in order that track could be laid in the tunnel. Track through the tunnel was laid in prefabricated panels and was completed in 3½ days. Approximately 5 miles of track had already been laid north of the tunnel, using material hauled in by trucks. This enabled the Railway Company to give quick service to coal mines developed by the Clinchfield Coal Company. Two train movements a day were maintained through the tunnel during the concreting operation with practically no delays to trains or the contractor's progress.

The plan was a success—the result of extraordinary teamwork among the mine owners, Norfolk and Western Railway Company personnel, the contractor—and modern advances in concrete technology.

Boring and Mucking Out—Boring of the Sandy Ridge Tunnel began at the south portal on July 3, 1957, and at the north portal on September 27, 1957. The tunnel was holed through on May 17, 1958. During the 10½ months from the start of the initial boring operation until the tunnel was holed through, approximately 190,000 cubic yards of material—mainly seamy sandstone, unstable shale, and coal—were removed.

The unstable nature of material surrounding the bore required installation of steel H-beam supports placed on an average of 4-foot centers. Four-and-one-half million pounds of these structurals were used in the tunnel. In addition, 1-inch steel reinforcing rods were installed on 2-foot centers between the H-beams when the concrete was placed.

Designing the Concrete Mix—Primary requisite for the mix to be used in Sandy Ridge concreting operations was that it develop high early strength—740 psi in 10 hours. This was to permit stripping of each 60-foot steel form so it could be moved to the next position and refilled every 24 hours. A 3,000 psi compressive strength at 28 days was specified.

Exceptionally good workability was also required of the mix to assure successful placing with pumped concrete. And an extremely high degree of concrete durability was necessary to meet the 50 years service life anticipated for the tunnel.

Work on design of the concrete mix to achieve this early form-stripping schedule and meet the other engineering requirements, began six months prior to actual placing of concrete on-the-job.

Norfolk and Western engineers and the contractor, Ralph E. Mills Company, investigated the availability and quality of local materials. One-inch top size Pounding Mill stone and dolemitic sand were decided upon because of their favorable durability record. A Type I cement was selected, and samples of these materials were forwarded to the engineering laboratory of The Master Builders Company in Cleveland, Ohio, where studies were made of the rate of hardening characteristics of concrete with various cement factors and admixture formulations. The rate of hardening test employed was the Bond Pin Pull-Out Method described in ASTM Proceedings, Vol. 57, 1957.

The results of these studies were returned to Norfolk and Western engineers who analyzed the data and selected the following mix. For one cubic yard:

Cement:	517 lbs. (5½ sacks)
Sand:	1485 lbs.
Stone,(1"):	1800 lbs.
Water:	27 gals.
POZZOLITH:	1.375 lbs. (¼ lb. per sack cement)
Calcium Chloride:	11.0 lbs.

This mix performed most satisfactorily and gave sufficiently high strengths (with a margin of safety) to permit 10-hour form stripping at the 60° aver-

NORTH TUNNEL PORTAL—The great difference in elevation on the two sides of the rugged Sandy Ridge Mountain required a 150-foot cut in the north approach to avoid excessive track grade.

THE SANDY RIDGE TUNNEL project was planned and carried out under the general supervision of A. B. Stone, Norfolk and Western Railway Company Chief Engineer (since retired), Walter L. Young, present Chief Engineer, and B. E. Crumpler, Assistant Chief Engineer. N & W Resident Engineers, C. W. Fiery and W. B. Cole, supervised the building of the tunnel under the direction of Pocahontas Division Engineer, L. A. Durham, Jr.

Contractor for the job was the Ralph E. Mills Company of Salem, Va. and Frankfort, Ky. General Superintendent and Project Manager—J. M. Lipscomb. William Houston was Tunnel Superintendent at the north portal and Richard Bingham at the south portal. Concrete tunnel lining operations were directed by Gus McMullin.

TUNNEL

age temperatures that prevailed in the tunnel.

Mixing and Placing Operations—Concrete materials were dry-batched in 1¼ cubic yard lots then transported to a 2-cubic yard dual power paving mixer at the south portal. The 4-inch slump concrete was finally discharged into rubber-tired dumpcrete bodies for delivery into the tunnel.

Concreting of the floor, curbs and footings proceeded immediately after the tunnel was holed-through. After curing was completed and tracks were laid, the tunnel opened for rail traffic on July 28, 1958—13 months after boring began.

Concreting of the tunnel lining began almost simultaneously at the midpoint of the tunnel and at the north portal. Two specially-fabricated, 60-foot long steel forms were used. Mounted on wheels, they were moved on 85-pound rails laid along the ballast wall.

The form was filled by pumping concrete at a rate of 50 cubic yards per hour. An average of 330 to 400 cubic yards was required for each 60 feet of tunnel lining. The concrete pump was part of a rail-mounted jumbo with two 6-inch diameter slick lines.

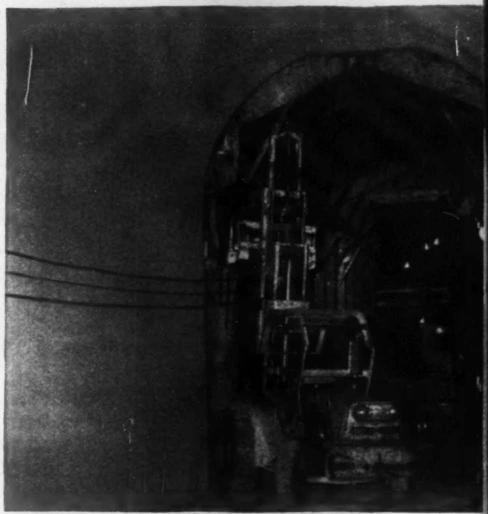
The POZZOLITH concrete mix had excellent coating of the aggregate and maintained its workability throughout the hauling and pumping operations. Only a few minor delays were encountered in pumping the concrete due to blocked lines.

The placing equipment was moved back and forth through the tunnel, alternately filling one form during the day shift and the other during the night shift. Twice daily, the jumbo was completely withdrawn and moved onto a siding to permit the coal-hauling operation previously described.

POZZOLITH and Master Builders Field Service—A total of 61,870 cubic yards of concrete were placed in Sandy Ridge Tunnel. POZZOLITH was used in approximately 50,000 cubic yards of the concrete and helped meet a broad range of engineering requirements. POZZOLITH was not used in the concrete floor and ballast curbs in the tunnel. Compressive strengths that permitted 10-hour stripping of forms were easily and economically achieved with a combination of POZZOLITH and calcium chloride. Other benefits resulting from POZZOLITH included reduced shrinkage and cracking, lower permeability and increased bond to steel.

From early planning through completion of the job, Master Builders field men and the Company engineering staff worked with the contractor to achieve uniform, superior quality concrete at lowest cost-in-place.

To better meet concreting requirements on your current and future projects—call in the local Master Builders field man. At no cost, he'll demonstrate—with your materials—how concrete produced with POZZOLITH becomes a more versatile and more useful building material . . . superior in performance, in quality and in economy to plain concrete or concrete produced with any other admixture.



FORM STRIPPING—In spite of forms being stripped every 10 hours, this work was carried out with no interruptions to coal shipments through the tunnel. Smooth, crack-free concrete surfaces required almost no finishing.

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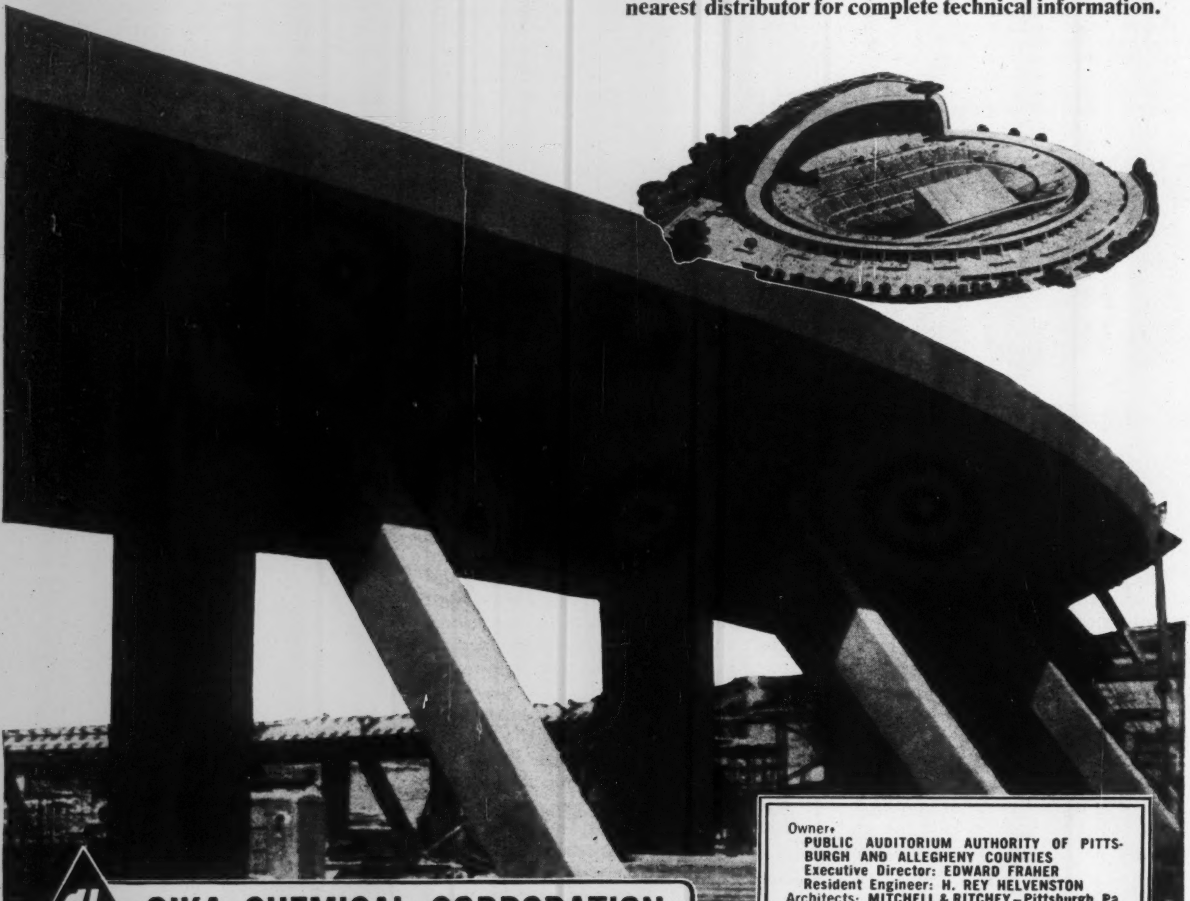

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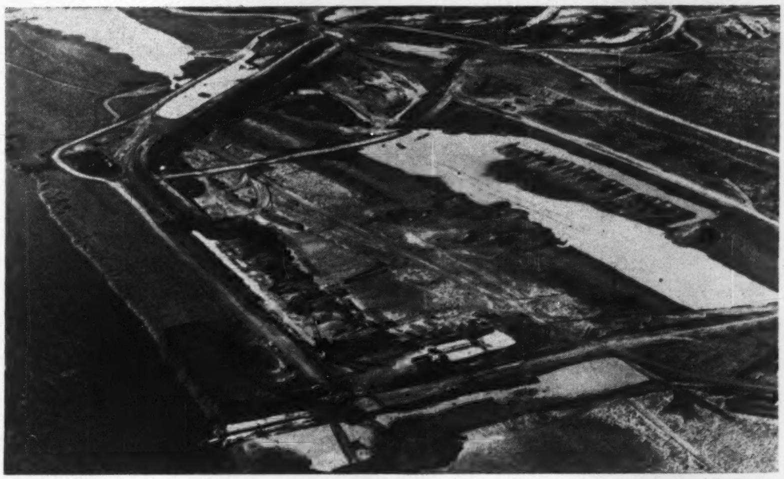
Major River Use and Control Projects



WANAPUM DAM, 18 miles up the Columbia River from almost completed Priest Rapids Dam, was started last year. About $32.5 million will be spent in 1960.

1. Columbia and North Pacific Basins

- **Anchorage, Alaska—**

Cooper Lake Project—An earthfill dam and mile-long intake tunnel were completed on this $13-million hydroelectric project at Cooper Lake. A transmission line from Kenai powerhouse, 750 ft below the Cooper Lake intake, to Anchorage is one-third complete.

- **Baker River—**

Upper Baker River Dam—Puget Sound Power and Light has completed their 300-ft concrete gravity dam on the Upper Baker River.

- **Clackamas River—**

North Fork Dam—Fish passage facilities costing $3.1 million were completed last year marking over-all completion of the major unit in Portland General Electric's $25-million project.

- **Clark Fork River—**

Noxon Rapids Dam—Washington Water Power Co.'s $87-million, 400,000-kw Noxon Rapids project was pushed to 93% completion in 1959.

- **Columbia River—**

Priest Rapids Dam—Project is 91% complete with three of ten generators operating under low head. Completion estimated for fall of 1960, a year ahead of schedule.

Wanapum Dam—Priest Rapids' $135-million sister project was started last July and is 5% along with placement of first concrete planned for next month. About $32.5 million will be spent on Wanapum during 1960.

Rocky Reach Dam—Chelan County PUD's hydroelectric project has reached the three-quarter mark. Completed last year were the powerhouse structure, relocation of 20 miles of railroad and highway, non-overflow center dam and grouting of a 2,000-ft cutoff. Generator installation, additional relocation, and reservoir clearing highlight work planned for 1960.

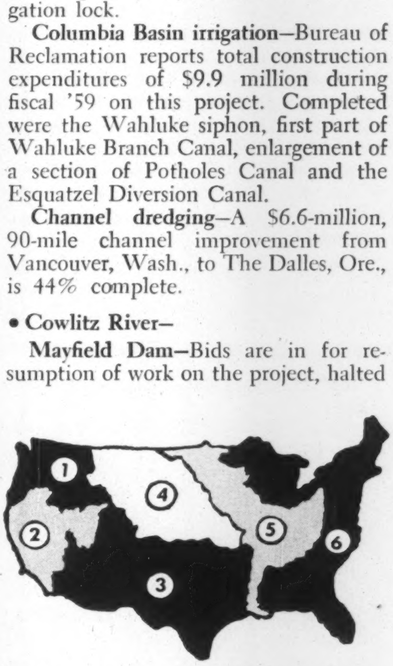
John Day Lock and Dam—First step cofferdam was started as this $418-million project got rolling in 1959. A $32.4-million contract was awarded for construction of north shore embankment, spillway bays and 113-ft-lift navigation lock.

Columbia Basin irrigation—Bureau of Reclamation reports total construction expenditures of $9.9 million during fiscal '59 on this project. Completed were the Wahluke siphon, first part of Wahluke Branch Canal, enlargement of a section of Potholes Canal and the Esquatzel Diversion Canal.

Channel dredging—A $6.6-million, 90-mile channel improvement from Vancouver, Wash., to The Dalles, Ore., is 44% complete.

- **Cowlitz River—**

Mayfield Dam—Bids are in for resumption of work on the project, halted in 1957 over legal difficulties. The 185-ft-high combination gravity-arch structure is expected to cost about $32 million.



Projects are grouped by major drainage areas, as shown on map.

- **Green River—**

Howard Hanson Dam—Railroad relocation was completed and an $8.9-million contract let for actual construction on the 235-ft rockfill dam. Excavation began on diversion tunnel, stilling basin and the inlet and outlet channels. Over-all progress on this $37.5-million project: 35% complete.

- **Middle Fork, Willamette River—**

Hills Creek Dam—This 335-ft earthfill structure for Corps of Engineers is 75% finished. Powerhouse, road construction and equipment installation is all that remains for total completion.

- **Skagit River—**

High Gorge Dam—City of Seattle reports 50% completion during 1959 on this 300-ft gravity-arch structure. River diversion completed, the dam site is excavated to bedrock and concrete placement has started.

- **South Fork, McKenzie River—**

Cougar Dam—Work has just started with the award of the prime contract for construction of this 445-ft rockfill dam. The 25,000-kw powerhouse should be started this year.

- **Snake River—**

Ice Harbor Lock and Dam—Corps of Engineers' $130-million project was 53% completed last year as work finished up in the first stage cofferdam. Second-stage contracts were awarded for completion of powerhouse, second-stage cofferdam, spillways and lock.

Oxbow Dam—Two power tunnels driven, a completed spillway, four penstocks and powerhouse excavation show steady progress on Idaho Power's triple-dam Hell's Canyon project. Oxbow is the second to be built.

- **Tolt River—**

Tolt River Dam—A 20-mile, 60-in. pipeline and 200-ft earthfill dam were started last year as Seattle's $24-million Tolt River Water Supply Development got rolling. At year's end, both pipeline and dam were 50% complete.

2. Central Valley and South Pacific Basins

- **San Joaquin River—**

Mammoth Pool Dam—Started January 1958, this $49.5-million hydro project was 97% complete at the end of 1959. The 330-ft earthfill dam was

GARRISON DAM on the Missouri River, when completed this year at a cost of $294 million, will store 24.5 million acre-ft of water and generate 400,000 kw of hydro power.

completed, an 8-mile, 20-ft-dia power tunnel holed through and all but finishing touches done on the 129,000-kw powerhouse.

- **Feather River Project—**

Oroville Dam—California Department of Water Resources reports relocation of railroad and highways around Oroville Reservoir well under way. About $50 million will be spent for relocation by 1962 when the state expects to ask for bids on Oroville Dam, $456-million key unit in Feather River project.

- **Kaweah River—**

Terminus Dam—Corps of Engineers reports 30% completion on the dam itself and 16% of a $4.7-million highway relocation finished during 1959. Terminus will form a 150,000 acre-ft lake for irrigation and flood control.

- **Sacramento Valley—**

Corning Canal—Bureau of Reclamation reports completion of the $6.7-million Corning Canal and the Corning pumping plant 60% complete.

Flood control—Corps of Engineers expects to add $14 million by 1965 to the $65 million spent on Sacramento River flood control.

- **Trinity Project—**

Trinity Dam—This 465-ft-high dam advanced to 80% completion during 1959. The $48-million structure will have a crest length of 2,440 ft and its reservoir will store 2.5-million acre-ft.

Clear Creek Tunnel—The $36.6-million, 17.5-ft-dia tunnel was roughly 67% finished at year's end with late 1962 as completion target. The 130,000-kw power plant contract will be awarded during 1960.

Whiskeytown Dam—Contracts for this 278-ft-high earth and rockfill dam will be awarded this year as will the 18.5-ft-dia Spring Creek tunnel and power plant. Power facilities alone account for $60 million on this phase of the Central Valley Project.

- **Tule River—**

Success Dam—This earthfill dam costing $6.6 million is 80% finished while Frazier Dike, an auxiliary phase of the project, is nearly complete. The Success project will store 80,000 acre-ft.

- **Upper American River Project—**

Ice House Dam—First unit completed in Sacramento Municipal Utility District's $145-million Upper American River Project, the 148-ft rock and earthfill embankment cost $4 million.

Jaybird Tunnel—The 4-mile, $5.5-million bore is 80% complete and the powerhouse is 20% along.

Junction Dam—Work is at the 20% stage on this concrete arch structure scheduled for completion in October of this year. A $6.5-million contract was let in December for the 5-mile, 15-ft-dia Camino Tunnel.

Union Valley Dam—Contract for $13.5 million was awarded late last year for this project that will create the largest reservoir in the system.

- **Cherry Valley—**

Cherry Canyon Development—By October of this year the $30-million first stage of the $54-million Cherry Canyon hydroelectric project in the Sierras will be completed. Two powerhouses will produce 202,000 kw.

3. Colorado, Gulf, Arkansas White and Red Basins

- **Upper Colorado River Project—**

Glen Canyon Dam—A prolonged strike over subsistence pay was finally settled this month on the $325-million project. At the turn of the year it was estimated that the contractor was 30 to 45 days behind schedule. Glen Canyon is about one-third complete.

Navajo Dam—More than 7 million cu yd of this 26-million-cu-yd earthfill have been moved and river diversion is near at hand. Bureau of Reclamation reports over-all project nearly 33% complete.

Flaming Gorge Dam—River diversion is complete and abutment work is proceeding on the 490-ft arch structure.

- **Reclamation Region 5—**

Middle Rio Grande project—Scheduled for completion in 1962, this program of river channelization and improved irrigation was reported 86% finished.

Fort Cobb Dam—Work on this $3.3-million unit of the Washita Basin project was completed last November.

Foss Dam—The $8-million embankment is 52% complete. It will irrigate 10,000 acres through 50 miles of aqueducts. Anadarko Aqueduct is 40% finished and Foss Aqueduct will be started this year.

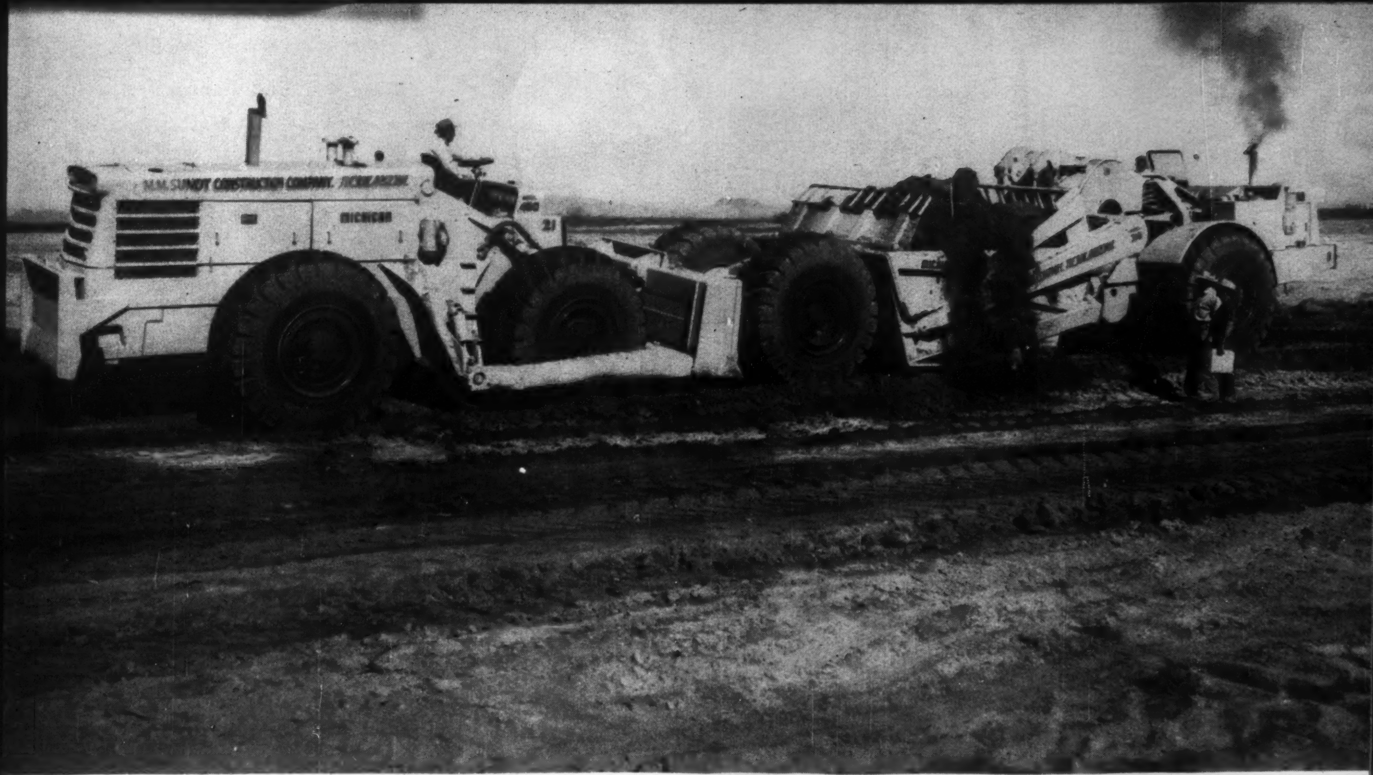
- **Arkansas River Basin—**

Dardanelle Lock and Dam—Last year, a $3-million contract for part of the 600 x 110 ft navigation lock was awarded. An estimated $10-million contract will be let this year for the main dam and spillway.

Keystone Dam—During 1959, $24-million worth of work got under way on the 121-ft-high earthfill embankment and spillway, pushing the $111-million project to 12% completion.

Eufaula Dam—Located on the Canadian River, this $141-million structure is 9% complete. Last year $6.5 million worth of work was under way and a $14.7 million contract let this month.

Oolagah Dam—Construction on this Verdigris River project is 58% complete. Diversion is scheduled for December 1960, with final completion by 1962.



600 hp Michigan Dozer heaps 29 yd Michigan Scraper in 35 seconds.

New machines, new ideas increase production 20%

5 Michigan Tractor Scrapers and a 600 hp Michigan Tractor Dozer, on Southwest Interstate job, move 8,750 tons daily

Some new equipment and some unusual techniques are helping M. M. Sundt Construction Co., Tucson, Arizona, get an important 20% increase in production:

The new equipment includes *five* 375 hp, 29 yd Michigan Tractor Scrapers and a big *600 hp*, 104,000 lb, Model 480 Michigan Tractor Dozer. The Scrapers are being push-loaded by the Dozer with an average of *35 tons in 35 seconds*...this weight is extremely accurate since *each load is being weighed*, according to Arizona state regulations, by a state representative on a truck-type platform scale.

Borrow sprinkled 7 days

The unusual techniques were developed to speed dirtmoving and to more easily meet strict compaction specs. For example, before digging starts, the dry, sun-baked borrow area is laced with perforated pipe. Water sprinkles out night and day for about a week. Once the soil is saturated seven to nine feet deep, Sundt turns off the water, removes the pipe, brings in his earthmoving machines. Pre-wetting, say men on the job—a 5.3 mile, $1,031,000 section of Tucson-Benson Interstate Highway—makes for easier loading. It also has eliminated the clutter of water wagons and motor graders and extra sheepsfoot rollers which previously kept scrapers waiting in line to unload.

Load at 7½ mph

With the Michigan Scrapers, loading of the damp 2800 lb/yd silty caliche mixture is done in second gear (7½ mph). Scrapers power-shift instantly to third (15 mph) as they're shoved off . . . move to and from the fill at speeds up to 30 mph. The result is 50 two-mile cycles *per Scraper* per 8-hour shift . . . 8,750 tons total . . . 20% more pay-dirt than previously moved by same size fleet of another make.

"The Monster"

The Michigan Model 480 Tractor Dozer is proving a remarkable pusher. The men have dubbed it The Monster. "It sure has power!" says Clay Smith, operator. "It loads these big Scrapers fast (usually in second gear 7½ mph) . . . backs up fast . . . goes from one borrow area to another fast (15 to 28 mph)."

Built-in scarifier

Where borrow is tight and tough, an optional Model 480 attachment, blade-mounted scarifier teeth boost production. When dozing or pushing forward, these teeth fold up, out of the way. But on return operator drops blade, teeth jut out and rip 8 inches deep . . . just right for the next scraper pass.

Michigan units like these are helping dirtmovers all over the country boost production. Three Scraper models—10½, 19, 29 yds—four Dozers—162, 262, 375, 600 hp—are now available. Your Michigan Distributor will be glad to show them to you.

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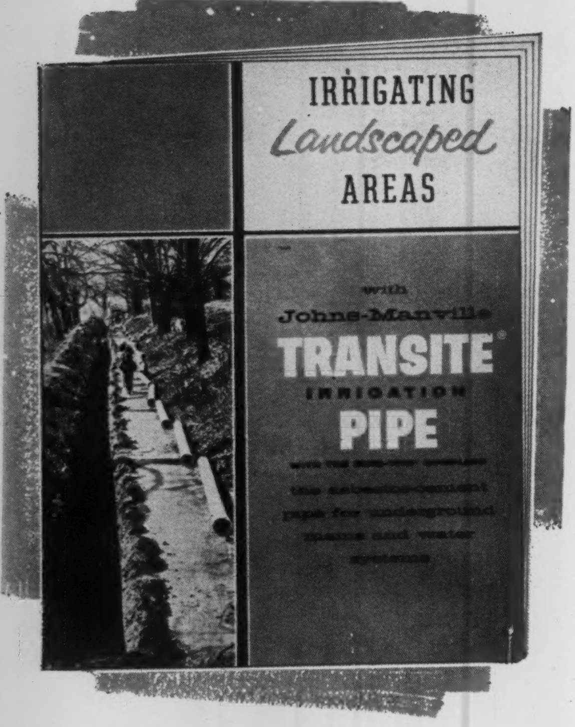

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To INSTALL an irrigation system that will give *every* performance advantage . . . *every* saving—you'll want to consider pipe materials carefully!

To help you do this we've prepared the factual new 6-page brochure "Irrigating Landscaped Areas." It illustrates how Transite® is installed . . . easily, quickly with your own labor. Shows typical riser connection methods, along with other helpful information on underground irrigation mains.

The booklet also shows why Transite saves on installation and pumping costs . . . why it never rusts . . . keeps maintenance to the barest minimum.

Write today for your copy of this informative new Irrigation booklet. Just ask for TR-212A. Address Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ont.

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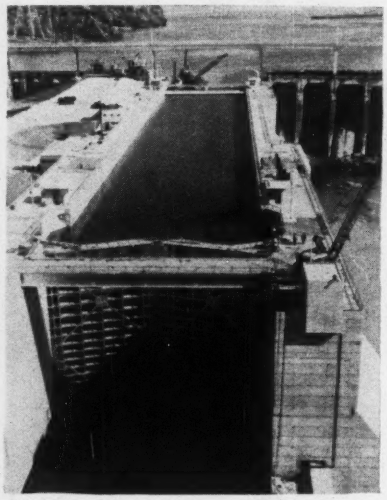
JOHNS-MANVILLE



WILSON LOCK, opened to traffic last November, has a single lift of 100 ft.

- **White River Basin—**

Greers Ferry Dam—With completion scheduled for 1964, the $52-million project is half done. Last year, $17 million of contracts were awarded.

Beaver Dam—Construction is just getting under way on this $56-million dam on the White River in northwestern Kansas. About $200 million worth of contracts will be awarded this year.

Table Rock Dam—Two 50,000-kw generating units went into operation last summer and the $66.5-million project reached 95% of completion.

- **Texas Gulf River Basins—**

Canyon Dam—Contracts for $1.7 million will be awarded this year for earth embankment and outlet channel. This $17-million flood control-water conservation project is 26% complete.

McGee Bend Dam—Completion of a 2.5-mile bridge over the river and the dam spillway add up to 19% completion on this $58-million job.

Waco Dam—Enlargment of the present Lake Waco on the Bosque River is included in the $40-million project that is now 8% finished.

- **Rio Grande Basin—**

Abiqui Dam—This 325-ft-high dam on the Chama River will contain 15 million cu yd of compacted fill and provide maximum storage of 1.2 million acre-ft. The $18-million project is nearly 8% complete.

4. Missouri Basin

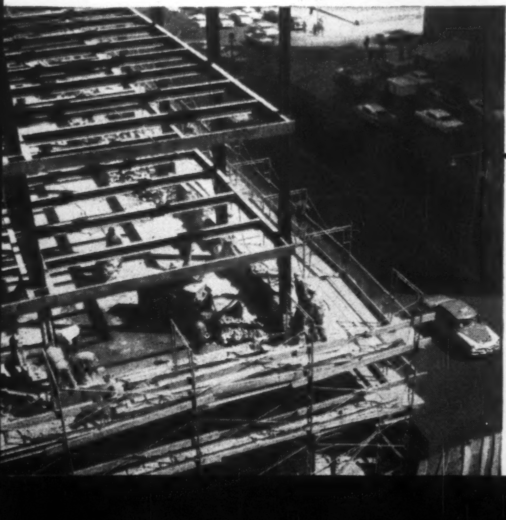
- **Missouri River Basin—**

Oahe Dam—This 91-million-cu-yd earthfill embankment, the world's largest, was topped off in November 1959. In addition, the first of seven power tunnels was holed through. Completion is

GOING DOWN! NEW METHOD cuts man-hours in half

Demolition costs substantially reduced as small Michigan Tractor Shovels release usual hand crews for other work. Rigs start 12 stories up, work down.

By using three 16 cu ft Michigan Tractor Shovels, Drachman Demolition Co, Inc, New York, was able to cut normal man-hour requirements in half and finish salvage and demolition of two 12-story Park Avenue apartment buildings in slightly more than six months.



Job calls for new methods

The economics of the operation, and the time element, called for modern materials handling techniques where formerly handwork was employed. Officials of the firm selected three small Michigan Model 12B's and one competitive unit of similar dimensions.

Two Tractor Shovels started at the 12th floor of each 200′ x 80′ building. Demolition crews left several feet of exterior wall for the Tractor Shovels to work against as debris was dumped through floor openings.

Up to 1½ tons per Michigan load

Drachman Job Supt, Ed Brown, says, "The Michigans out-performed the other make by getting bigger loads faster." Their hydraulically operated 16 cu ft buckets with 3,000 pound lift capacities handled the broken bricks and concrete with ease.

Upon completion of cleanup on each floor, the Tractor Shovels were lowered to the floor below by simple chain block and falls. Crews then broke down the remaining wall and floor permitting it to fall to the floor below. Huge cranes removed the steelwork last.

Supt Brown says, "The Michigans' enabled us to more efficiently use our labor force. We needed only about one half the man-hours normally required for demolition work on a job this size."

Perhaps you need a Tractor Shovel with similar labor-saving abilities to work fast in restricted areas. There's the 16 cubic foot Model 12B and seven larger sizes up to 6 cubic yards.

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WAHLUKE SIPHON, completed last year, has a 15.4-ft dia and will carry irrigation water at a rate of 2,000 cfs to the Columbia Basin region.

scheduled for 1964, and the $380-million project is roughly half done now.

Garrison Dam—Last two power units in the $294-million project will go in service by next summer at which time the over-all job will be essentially completed. About $3 million in contracts will be awarded this year.

Big Bend Dam—Work got rolling last year on Big Bend, last of the six mainstem Missouri River dams. Initial contracts totaling $9 million were awarded last year while roughly $40 million worth will be awarded this year.

Fort Peck Dam—A second power plant with two additional 40,000 kw generators is 60% finished. Both new generators for the $160-million project will go on the line in 1961.

Tuttle Creek Dam—Closure of the $85 million dam on the Big Blue River was made last July. At present, the job is 60% complete and scheduled for a June 1962 finish.

Pomona Dam—Construction was started last year on the $14.1-million-project as $2.6 million in contracts were let for work on outlets, spillway and embankment. Completion target: 1963.

Pomme de Terre Dam—Located on a tributary of the Osage River in Missouri, this project is 59% complete with all major contracts awarded.

Navigation improvement—Corps of Engineers' Missouri River bank stabilization and channel improvement program accounted for $12 million in contract awards during 1959.

5. Mississippi and Ohio Basins

• Calumet-Sag Channel—

Navigation Improvement—The west 10 miles of this 16-mile-long, $104,-million channel improvement was completed last year. Another three-mile stretch under contract for $2.8 million is well along.

Thomas J. O'Brien Lock and Dam—This $5.8-million phase of the Calumet-Sag improvement will be completed this year.

• Ohio River Basin—

Barkley Dam—Corps of Engineers' $182-million dam on the Cumberland River is 12% complete over-all. Designed for navigation, flood control and power generation, Barkley's lock construction is 42% along.

New Cumberland Locks and Dam—Corps of Engineers reports 72% completion on this project which includes two locks 110 ft wide.

Markland Locks and Dam—The $65.3-million system at Markland, Ind., will replace five older locks on the Ohio. Now 42% complete, the main lock has been operating since last spring.

Greenup Locks and Dam—A third lock project, 71% complete, Greenup will replace Ohio River locks 27, 28, 29 and 30, plus Big Sandy No. 1.

Pike Island Locks and Dam—Award of a $22.8-million contract for lock work and minor dredging marked the only '59 start of the six projects under way on the Ohio River Navigation Dam Replacement and Modernization program. Nineteen modern locks and dam structures will ultimately replace 46 existing facilities.

Captain Anthony Meldahl Locks and Dam—This was formerly known as the New Richmond project. A $25.2 million contract for construction of locks, guardwalls and operations building was 20% complete.

Locks and Dam 41—Addition of a 1,200-ft main lock and widening of Louisville and Portland Canal are 36% complete.

Hildebrand Locks and Dam—This $12.5-million modernization on the Upper Monongahela River was essentially completed at year's end.

Allegheny Reservoir—This $119-million major unit in the program to protect Pittsburgh and the Upper Ohio Valley will get started this year.

• Lower Mississippi River—

Mississippi Levee System—The 1,575-mile backbone of this flood control plan is 89% finished. The $472-million channel stabilization is 88% complete.

St. Francis River Basin—Construction continues on 480 miles of levees, two pumping plants and 315 miles of channel improvements for this flood control project.

Big Sunflower River—Channel improvements that will give flood protection to 568,000 acres are 46% complete.

Mississippi channel—A 9-ft channel depth for a distance of 195 miles is the goal of a $62-million channel improvement from the confluence of the Ohio to the mouth of the Missouri.

Mississippi River-Gulf outlet—Dredging contracts totaling $5 million were awarded last year on the $105-million project that will provide an additional outlet to the Gulf of Mexico for the Mississippi River at New Orleans.

Carlyle Dam—The $41-million project on the Kaskaskia River in southern Illinois is well advanced. It will furnish flood control and aid navigation on the Mississippi River during low-water periods.

Old River Control—Designed to prevent the Mississippi River from leaving its present channel and flowing down the Atchafalaya Basin, the project is 47% complete. The outflow and inflow channels are 52% finished while the overbank structure was completed.

• Upper Mississippi River—

Pigeon Creek Reservoir—Construction began last year on this $22.5-million flood control project that will protect 125,000 acres of rich farm land along the Mississippi in west central Illinois.

Michigan rubber-tired dozer prevents job shutdown

Haul trucks bogged down until Model 280 arrives to spread fill and compact in one operation

When a Michigan Model 280 Tractor Dozer was put to work on the Rieth-Riley Construction Co job near South Bend, Indiana, filling and compacting problems—which threatened to close the job—were solved.

It was early spring. This Goshen, Ind, firm was working on a $1,000,000, 644,000 yd contract, building part of a divided highway to bypass South Bend. Trouble started when pockets of wet glacial clay were encountered. Then it snowed and the material became even more unstable. The dozen 10 yd trucks hauling onto the fill were continually bogging down. A 10-ton, 3-wheel roller couldn't compact fast enough and a pair of 200 hp crawlers couldn't spread fill and pull out trucks too. The job was near a stand-still.

At this point, Grade Foreman "Cannonball" Condra thought it might be a "good idea" to try a mobile Michigan Tractor Dozer. Michigan Distributor, Deeds Equipment Co, brought out a 262 hp Model 280.

Half a day's work with the Model 280 unsnarled the tangle. The key was speed. The fast rubber-tired rig could assist trucks when they bogged down and still have time to spread material across the length and 250 ft width of the fill.

Compaction: 95% in normal dozing

Later, an even more amazing thing began to happen. As the day wore on, trucks no longer became mired in the unstable material. The Model 280 with its big tires and working weight of 56,000 lbs, was compacting fill so well the trucks could get through. Moreover, in the *normal course* of its dozing job, required compaction was being attained by the Michigan alone . . . compaction which equalled the specs of 95 to 100% Proctor.

So, trucks got through and the job was kept open. The Michigan Model 280 handled the spreading of fill and compaction for 12 trucks—3,000 pay yds per 10 hr day. The two crawlers were put on standby. Track costs, a major problem in the sandy material, were eliminated. The roller was retired.

In later weeks, as weather and soil conditions improved, the Michigan's versatility, power and speed paid off even more. On push-loading assignment, for instance, the Model 280 loaded 15-yd scrapers in 45 seconds. Grade Foreman Condra put it this way, "I won't say our Michigan will do everything, but I am convinced we can't get along without it." Maybe *you* "shouldn't get along without a Michigan" either. Why not call for a demonstration. Choose from four sizes—162, 262, 375, and 600 hp.

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"OF ALL THE MAKES WE'VE TRIED FORD TRUCKS GIVE US THE LOWEST MAINTENANCE COST!"

ANOTHER REPEAT BUYER OF FORD TRUCKS

Virgil E. Cook, owner of Cook Block and Brick Co., is convincing proof that there is still plenty of opportunity in American business for those sound planning, hard working individuals who want to own their own business. Starting from scratch just 13 years ago, he now owns and operates one of the largest concrete products plants in Eastern Indiana. The workhorses in his fleet of 16 trucks are three Ford Tilt Cab Tandems that are used to haul sand and gravel to the plant and make deliveries in and around Anderson.

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BLOCK

Hard-working Ford CT-950 tractor leaves Cook gravel pit with 18 yards of aggregate. Aluminum walking beam and rubber suspension system of tandem axle assembly reduce chassis weight, permit higher legal payloads.

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Cook's CT-850 with special flat-bed body and Side-O-Matic unloader delivers blocks right to the job site. Unit carries 600 concrete blocks and spots them where needed.

"Our experience has proved that Ford Trucks can be operated at substantially lower maintenance costs than any other make we've tried. And, equally important in a fleet like ours, we find that our Fords spend much less time in the shop. None of the Ford units purchased since 1958 have been in for major repairs and I am still amazed at the way the older ones keep going.

"The best truck we've ever owned is a 1954 Ford C-700 that consistently carries a load of 350 to 400 blocks over all types of terrain. In spite of this severe work it ran 125,000 miles before we replaced the engine. This unit now has over 140,000 miles on the original ring gear and pinion and it went 60,000 miles before we relined the brakes and put in a new clutch. This is outstanding mileage when you consider that we've realized as little as 12,000 miles from competitive ring gear and pinion sets. Clutch and brake life obtained with other makes in identical service was only 20,000 miles. It's results like this that keep our costs low and convinced us that we should stay with Fords when we bought our bigger trucks in '58.

"Our 1958 and 1959 Ford Tilt Cab Tandems give every indication of equalling or surpassing the fine records set by the C-700. The two CT-950 tractors hauling sand and aggregates to our processing plant breeze through traffic and take the hills like they weren't there at all. Our CT-850 equipped with a flat-bed body has the power and traction to deliver finished products anywhere. With Ford's tilt-cab design we get a real plus as far as payload is concerned because we can carry at least 2,000 pounds more weight on the front axle.

"We buy Ford Tilt Cab Trucks because we think they're the best engineered and most modern gasoline trucks in the heavy-duty field. Here at last is a truck built to permit big legal payloads with enough power to move these loads at economical speeds. We pride ourselves on our modern and efficient equipment and consider our Fords one of the most valuable assets of our business."

'60 Fords are built for longer life . . . with Certified Durability!

Whatever your job . . . wherever you do it . . . you'll discover just as Mr. Cook did, that Ford Trucks are the best investment for your transportation dollar.

Certified results of tests conducted by America's leading independent research organization (name available on request) confirm the fact that Ford Super Duties have been refined for still more durability! Automatic radiator shutters, improved electric fuel pumps and redesigned wiring harnesses are typical of the advancements to be found in these units.

Automatic radiator shutters reduced the coolant temperature variation recorded in severe mountain road tests from a 79° range to a 20° range. Engine operation with coolant temperatures in the 167° to 187° range means less expansion and contraction, more efficient combustion and better lubrication . . . all of which contribute to longer engine life.

Dynamometer tests showed *no vapor lock* with Ford's submerged-type electric fuel pump at temperatures up to 200°. Incipient vapor lock with mechanical fuel pump resulted in a power loss of 9% under the same conditions. Shaker table tests plus constant exposure to oil, water and heat proved 1960 wiring harness to be *three times longer lived.*

FORD TRUCKS COST LESS

LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!

OLD RIVER CONTROL project above Baton Rouge, designed to control Mississippi River flow into the Atchafalaya Basin, is nearly 50% complete.

Red Rock Reservoir—Another flood control dam, rolled earthfill on both sides of a concrete gravity-type spillway, will get under way this year. Cost: $75 million.

St. Anthony Falls Locks—At Minneapolis, work started late last year on a $9.6-million contract for the Upper Lock at the falls. Cost of the St. Anthony Falls project is $32.7 million.

- **Tennessee Valley—**

Wilson Locks and Dam—Dedication ceremonies took place in November and the Corps of Engineers began operation of the new lock. The old tandem lock is undergoing redesign and repair.

6. Atlantic Ocean Basins

- **New England Flood Control—**

Connecticut River Basin—There are six major flood control dams under construction in this area representing a total federal outlay of $40.5 million. Otter Brook Dam was completed last year. Ball Mountain Dam is 66% complete; North Hartland Dam, 68%; North Springfield Dam, 78%; Townshend Dam, 66%; Mad River Dam, just started.

Housatonic Basin—Two earthfill dams are going up on the Naugatuck River. Corps of Engineers reports Hall Meadow Brook Dam will start this year while Thomaston Dam and Reservoir is 78% complete.

Merrimack Basin—Two dams, two spillways, two canals and four dikes will comprise the Hopington-Everett flood control project aimed at taming the Contoocook and Piscatquog rivers. Costing over $30 million, the program is 11% complete.

Blackstone Basin—Woonsocket Local Protection project in Rhode Island is essentially complete and operating. A tainter gate dam and 8,300 ft of channel improvement is designed to guard Woonsocket from another Blackstone River rampage like the one in 1955. The Worcester Diversion project in Massachusetts is 95% complete. A 4,200-ft, 16-ft-dia tunnel is main feature of this local protection program. A 2,400-ft-long earthfill, West Hill Dam, is 41% complete.

Thames Basin—Corps is spending $17.8 million in this area on three structures, Hodges Village Dam, now 95% complete; East Brimfield Dam, 80% done; and Westville Dam, now barely under way.

- **Delaware River Basin—**

Channel improvement—Seven dredging contracts, totaling $30 million are currently under way for deepening and widening of the Delaware River channel between Philadelphia and Trenton. Progress to date: 35% complete.

- **Mobile River Basin—**

Jackson Lock and Dam—Corps of Engineers reports 66% completion on this $21-million project on the Tombigbee River. A 110x600-ft lock will replace three older locks on this stretch of the Warrior-Tombigbee Waterway.

Weiss Dam—Alabama Power Co.'s 84,000 kw hydro-electric project on the Coosa River is 50% complete.

Lewis Smith Dam—This hydro unit on the Warrior River, another of AP Co.'s generating facilities, is 46% finished and will cost $30 million. A rockfill structure, it will be 300 ft high.

- **Apalachicola River Basin—**

Walter George Lock and Dam—Corps reports this $87-million project 30% finished. An $11.8-million contract has been awarded for construction of the lock, which will have an 88-ft lift.

Columbia Lock and Dam—Construction has just started on this job, fourth dam in the development of the Apalachicola-Chattahoochee-Flint river system for navigation, flood control and hydro power.

- **Savannah River Basin—**

Hartwell Dam—Scheduled for completion in 1963, the $96-million project is 90% finished. Corps reports expenditures of $21 million on Hartwell during 1959. Bids on the powerhouse will be opened in July.

- **Central and Southern Florida project—**

Flood control and drainage—Corps of Engineers' $338.8-million, long-term drainage and flood control project is 21% complete. Over-all program includes extensive levee and canal construction and 13 pumping stations.

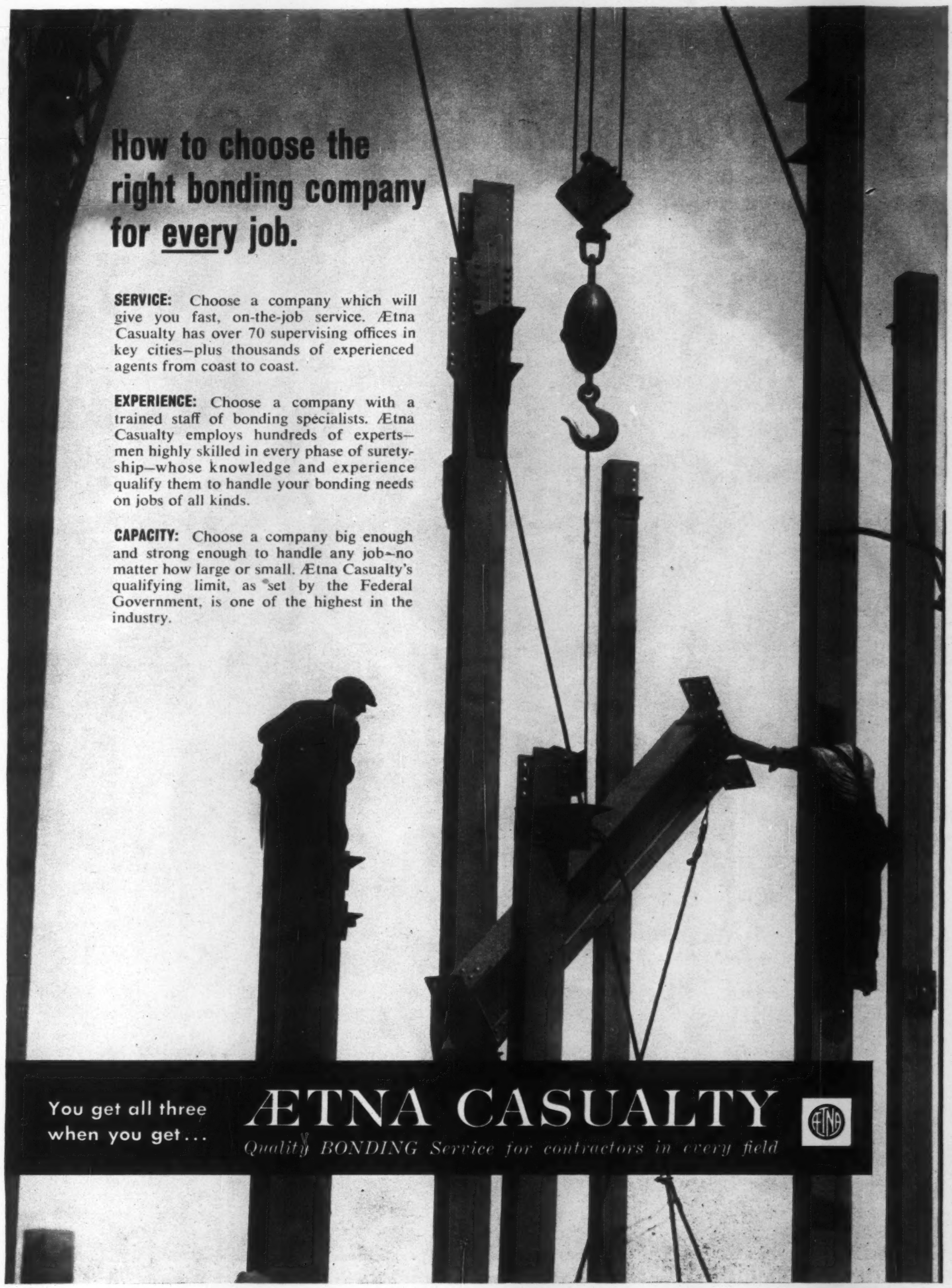
- **Great Lakes, Niagara, St. Lawrence—**

Niagara Power Project—Work has reached the hallway mark on the $704-million hydro project. Through December of '59, $470 million in contracts had been awarded. Concrete placement at Tuscarora Pump Generating plant was 35% complete while waterway and power canal excavation is 70% along. Conduit construction is progressing steadily and concrete placement on this phase is due to continue throughout the winter. First power production is slated for February 1961.

Great Lakes Connecting Channels—This $141-million project involving the deepening of connecting channels between the Great Lakes, is 35% finished. During 1959 the Amherstburg deepening of the Detroit River was completed.

Great Lakes Basin—Last year $48 million worth of civil works construction was completed in Michigan by North Central Division, Corps of Engineers. Work included channel dredging, Kalamazoo River flood control and removal of Bridge Island from St. Marys Falls Canal at the Soo. This year should see demolition and excavation for a new lock at the Soo to replace existing Poe Lock.

St. Lawrence Seaway and Power Project—Dedicated in 1959, about $650 million worth of power project and $471 million worth of navigation works had been completed in the international project. The Great Lakes are opening up to seagoing vessels, and power production for both the U. S. and Canada has started.



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SERVICE: Choose a company which will give you fast, on-the-job service. Ætna Casualty has over 70 supervising offices in key cities—plus thousands of experienced agents from coast to coast.

EXPERIENCE: Choose a company with a trained staff of bonding specialists. Ætna Casualty employs hundreds of experts—men highly skilled in every phase of suretyship—whose knowledge and experience qualify them to handle your bonding needs on jobs of all kinds.

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The Dominant Issues: Interstate

TEXAS STYLE INTERCHANGE—This four-level intersection of two Interstate highways outside of Fort Worth is one of the more spectacular examples of the 377 miles of expressways that Texas has built under the Interstate highway program.

Highways; Urban Transportation

- **Congress will turn the spotlight on the Interstate program. Expect investigations of its progress, floor battles over financing.**
- **Improved equipment and methods in highway construction will make sharp competition even sharper, low-unit prices even lower.**
- **Commercial airport construction will increase as major cities prepare for heavy jet traffic. But airbase work will decrease.**

Two major issues will continue to dominate the transportation scene in 1960:

The National System of Interstate and Defense Highways—its financing, progress and problems. Because of its sheer magnitude and nationwide scope, attention is focused upon the Interstate program at every level of government and by the general public.

The urban transportation problem, a matter of vital concern in every major city in the country. Here, attention must be given not only to highways, but to every form of transportation, especially those capable of moving large numbers of people relatively short distances in brief periods of time.

The transportation problem is urgent in America's great cities; and it will remain urgent for years to come. Here the engineer finds not only the most complex transportation design problems, but the absolute necessity of adapting himself and his plans to the views of many other specialists—planners, economists, sociologists, and many more—in order to serve the common good.

Due next week is the final report of the exhaustive study being carried out by the Department of Commerce. The report is expected to recommend changes in federal transportation agencies and deal with government regulation of transportation rates.

In any event, recommendations of the report are not expected to deviate from the established policy of "encouragement of all forms of competing transportation as benefiting the nation's defense and economy." Implementation of the study's recommendations will be largely dependent upon legislation.

For this reason, little in the way of concrete results can be expected before the end of this year.

Here, in capsule form, is a review of accomplishments in 1959 and a look at the future for each major form of transportation.

- **Highways**—Although 1959 was a start-and-stop, on-again off-again year for highway construction, it was a year of big accomplishments (in construction dollar volume, second only to 1958).

This year will be another big one, as the Interstate program maintains its impetus and the states adjust to BPR's controlled rate of expenditure. There'll be financing fireworks this year, too—and investigations of the conduct of the highway program. Target year for a complete review of the program, however, is 1961, when major reports on highway benefits, taxation and the AASHO Test Road are due.

- **Bridges**—Last year saw the completion of several notable American Bridges—the Houghton-Hancock lift span in the upper peninsula of Michigan and the Arthur Kill railroad span between New York and New Jersey—and starts on others, including the long-sought Narrows Bridge between Brooklyn and Staten Island. Among the newer materials, aluminum, high-strength steel and prestressed concrete are holding the spotlight.

- **Airports**—Progress was made in 1959 toward meeting the $1-billion-plus price tag on modernization of the nation's airports. And there's more to come in the next several years as U. S. airports tool up to meet requirements of the jet age. Big spending is at the big terminals, but small and medium-sized airports are also in the act.

- **Rapid transit**—The past year saw a lot of conversation and a few definite proposals for new or expanded rapid transit systems in major U. S. cities, but little concrete action. The merits of mass transit vs. freeways is a hot subject in San Francisco and Washington, D. C. And in Boston, a non-paying commuter railroad was converted to an apparently successful rapid transit line.

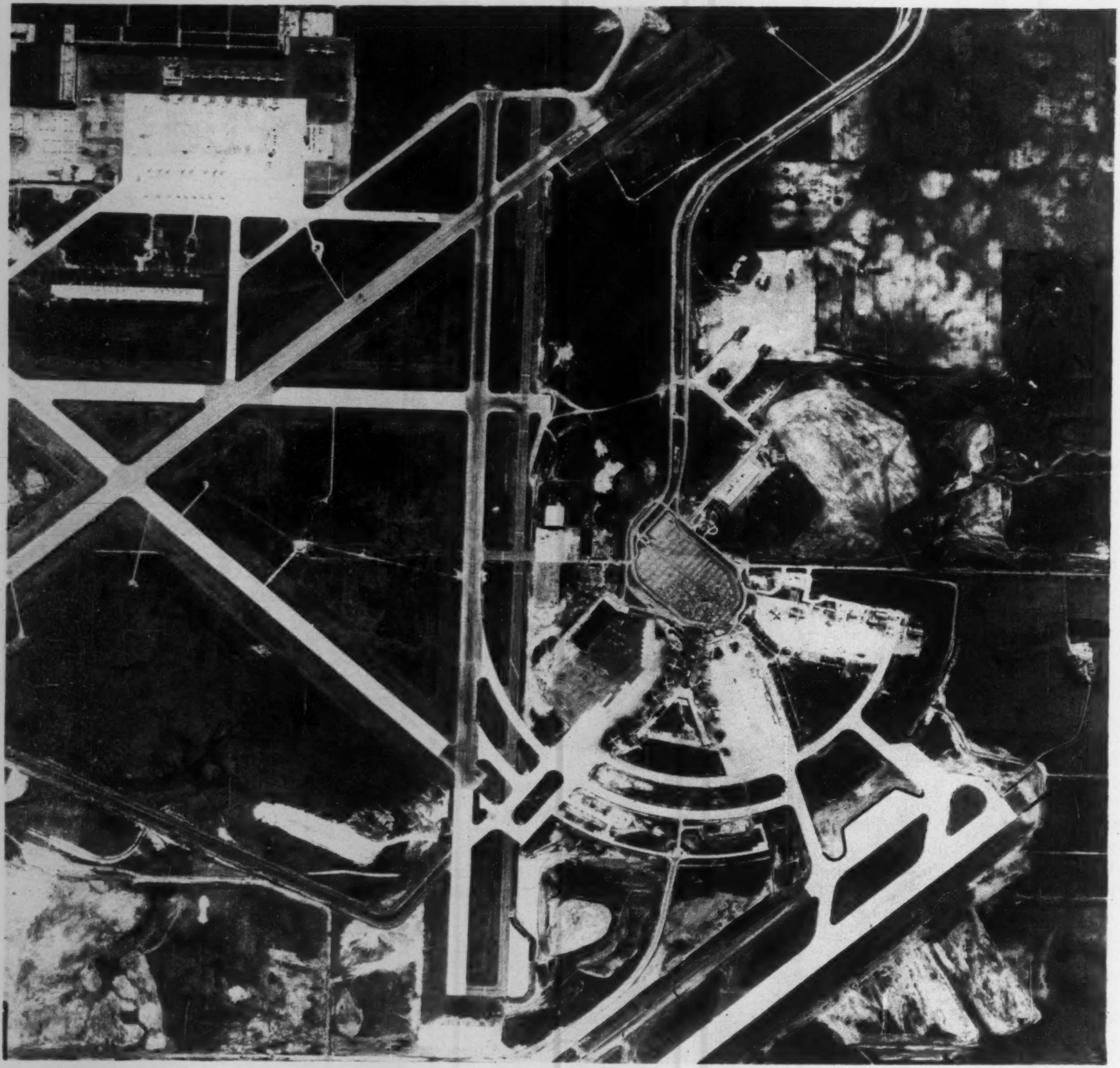
- **Waterways**—The dedication of the St. Lawrence Seaway last year represented a milestone in the development of inland waterways. But bottlenecks remain, particularly in the Welland Canal, where five duplicate locks are needed. Estimated cost: $150 million. Ports on the Great Lakes stepped up improvements necessary for handling ocean-going vessels, and began to clip away at an estimated $100 million backlog of other necessary construction. To meet Seaway competition, big East-coast ports—notably, New York—have accelerated work on long-needed improvements and expansions.

- **Railroads**—Aside from bridges, 1959 was largely a hold-the-line year for construction on railroads. Notable exception was the Union Pacific's new fill across Great Salt Lake, completed last year. At year's end, the Southern Railroad announced plans for a major relocation of its line east of Anniston, Ala., crossing the southern extension of the Smoky Mountains.

- **Airbases and missiles**—Transition of the nation's defense posture from one based on piloted aircraft to missiles was reflected in construction during 1959. Construction of a strategic bomber base near Racine, Wis., was halted abruptly in early fall.

Here's a more detailed rundown on the transportation situation at the end of 1959, and what lies ahead in 1960.

Major event of 1959 was the com-



CHICAGO'S O'HARE FIELD, as seen from an incoming airliner, shows signs of expansion construction under way, two hangars for commercial jet aircraft and the extension of a major runway. Hangars will be completed in fall, runway in spring.

promise Interstate financing plan finally adopted by Congress late in the summer. It imposed a temporary one-cent-a-gallon increase in the federal gas tax, effective July 1, 1961, and provided for diversion of some federal excise taxes on vehicles from the general fund into the highway trust fund, also effective July 1, 1961. Net result was to drop authorization for fiscal 1961 from $2.5 billion to $2 billion for the Interstate System. Authorization for fiscal 1962 remains at $2.2 billion, as provided by the 1956 act.

Allocations for fiscal 1961 and 1962 will be held to $1.8 billion and $2.0 billion, respectively to keep the Trust Fund from going into the red. And BPR instituted a system of "contract controls," under which the states are now operating. It is designed to further insure against overdrawing the Trust Fund.

Outlook for the first six months of 1960 is bright—the states expect to let $1.72 billion of federal aid contracts in that period.

The Administration is expected to ask for another ½-cent boost in the federal tax on gasoline, which would produce an estimated $310 million per year in added revenue.

Congress must act this year on authorizations for the ABC systems for fiscal years 1962 and 1963. In fiscal '61, this amounts to $925 million in federal funds matched on a 50-50 basis by the states. Question apparently will be whether to continue a previous annual rise of $25 million, or to maintain these funds at present levels.

Target year for a comprehensive review of highway financing remains 1961, when BPR's major reports and the results of the AASHO Road Test in Illinois are due.

The Highway Cost Study will be the most important BPR report. Purpose: "To make available to the Congress information on the basis of which it may determine what taxes should be

"Traffic-go-round" Texas-style!

Reinforced CONCRETE

Four-Level Interchange at Fort Worth . . .

Just imagine designing this four-level interchange in a construction material other than reinforced concrete. Texas highway engineers found reinforced concrete the logical, economical solution. Here the design called for a direct-connect interchange in a restricted right-of-way. They chose the shallowest possible construction . . . continuous reinforced concrete slab. This provided guaranteed minimum over-all height with the required vertical clearance for the lower roadway levels. The design flexibility of reinforced concrete also simplified the forming problems for fitting curves and varying elevations with no complicated shop details. On your next bridge or multiple overpass, design for beauty plus economy . . . and stay on schedule with reinforced concrete.

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38 South Dearborn Street, Chicago 3, Illinois

Designer: Bridge Section, Fort Worth District, Texas Highway Department
Contractors: Austin Bridge Company, Dallas, and Worth Construction Company, Fort Worth

NEW NIAGARA CROSSING—The American Rapids Bridge at Niagara Falls was completed except for painting by the end of 1959. It has the longest continuous plate girder span in this hemisphere, 450 ft. Bridge will be open to the public in the spring.

imposed by the United States, and in what amounts, in order to insure insofar as practicable, an equitable distribution of the tax burden among various classes of persons using the federal-aid highways or otherwise deriving benefits from them."

The report will be submitted to Congress next January and will incorporate at least some of the findings of the AASHO road test.

By next year BPR may also have recommendations on a policy of reimbursement for toll roads incorporated in the Interstate System.

The AASHO Test Road at Ottawa, Illinois, is the most elaborate of all the road tests. Traffic has been rolling on it steadily since the fall of 1958. Tempo of traffic was increased this month to accomplish even more applications of load before test vehicles stop moving in July.

Work by the Bureau of Public Roads on the studies called for by the Federal Aid Highway Act of 1956 resulted in one major report in 1959—"The Federal Role in Highway Safety." Concentrating on the traffic accident problem, the report gave support to judgments formed over the past years on many highway safety matters, exposed certain widely held misconceptions concerning traffic accidents.

As a result of a critical report submitted to the Congress by the General Accounting Office in July, plans have been announced for three investigations of the highway program. GAO's report called for tighter control over the ABC program and the adoption of uniform "maximum" design standards for the Interstate System, criticized state contracting procedures, called fees for highway consultants in some states "too high," and questioned ROW acquisition procedures.

Principal fireworks are expected to come from a House subcommittee headed by Rep. John Blatnik (D., Minn), who will probe charges of alleged waste, graft, and improper spending of federal funds in connection with the program.

Both of the other investigations are expected to proceed more slowly. Financing of the program will be under the scrutiny of the House Ways and Means Committee under the leadership of Rep. Wilbur Mills (D., Ark). A request for new taxes by the Administration may step up the tempo of this study, but major action probably will be deferred until next year.

The White House study of the administration of the highway program is being conducted by the President's Special Assistant for Public Works Planning, Gen. John S. Bragdon. This group may focus attention upon urban vs. rural phases of the Interstate program.

Still another pot is boiling as the result of a request by the Department of Defense for an increased clearance on bridges (overpasses) on the Interstate System. The original request called for an increase in the present 14-ft height to 17 ft. This policy was approved by AASHO. Purpose is to allow movement of existing and planned missiles over these roads. Late in December, the Secretary of Defense officially requested a 16-ft bridge clearance, but said 17 ft would be "highly desirable."

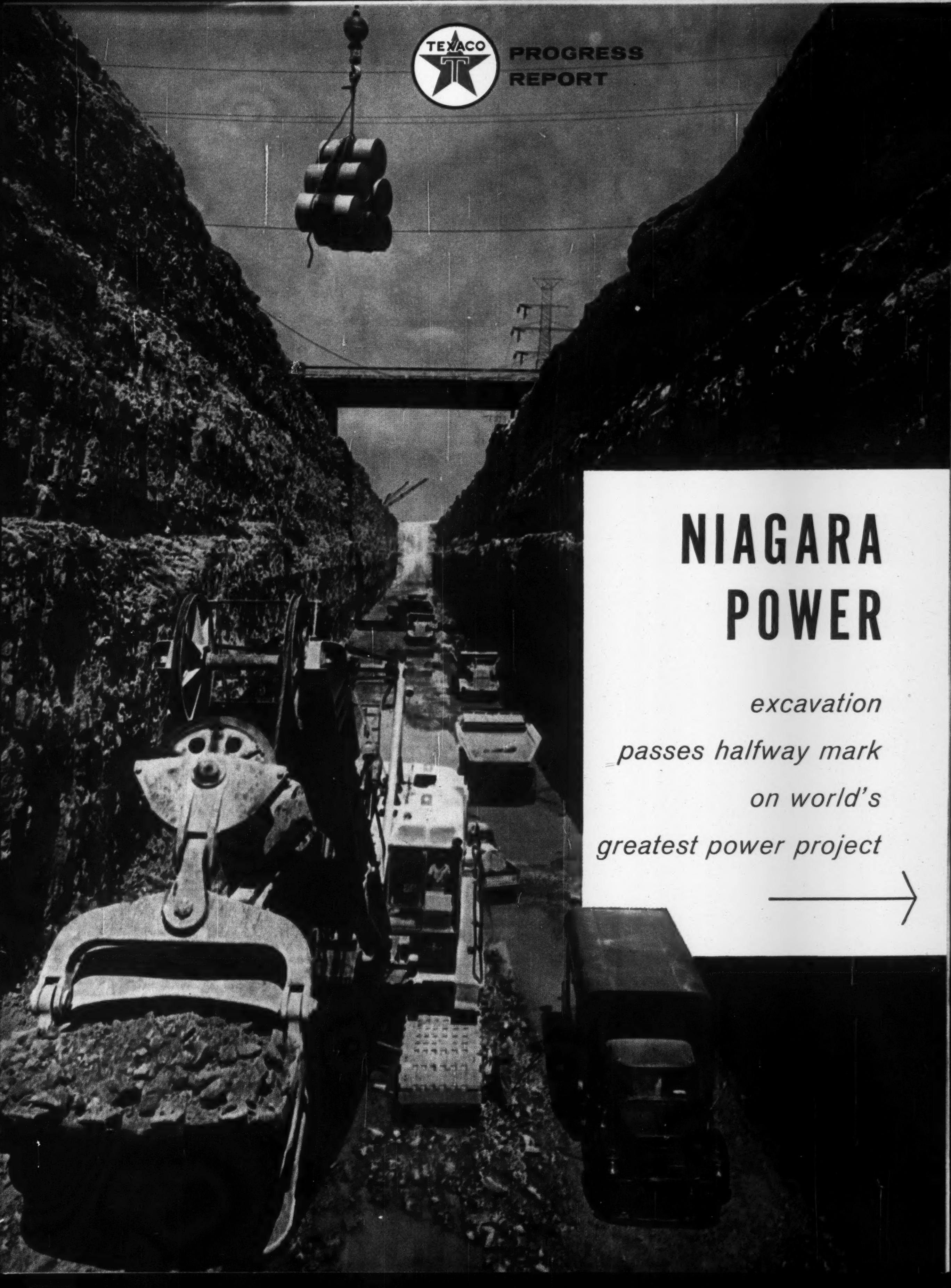
Big issue is the extra cost, estimated to be $200 million (16-ft clearance) for future bridges plus an undetermined amount to raise existing bridges, should this be necessary.

Most impressive is the rapid advance of mechanization in design. Use of aerial photographs—often teamed with computers—is commonplace and has served to eliminate many time-consuming and tedious design tasks. Electronic computers are well established and their use is being expanded rapidly. They are now commonly used in earthwork computations, locations studies, traffic analyses and bridge design.

The use of consultants in highway design by state highway departments has been under fire, particularly in New York and Pennsylvania. Outlook for consultants in the highway field is about the same for this year as last. Certain state highway departments—particularly certain large ones—will use consulting firms to relieve peak loads that can not be handled by their own organizations.

Contractor competition for highway jobs in most parts of the country was rough last year and will be sharp again

TEXACO PROGRESS REPORT



NIAGARA POWER

excavation passes halfway mark on world's greatest power project

→

THE NIAGARA GENERATING PLANT, a $99-million Merritt-Chapman & Scott project, stretches over 1000 feet along the Niagara River. Slated for completion in mid-1962, the giant hydroelectric project will deliver almost 2,000,000 kw to power-hungry industry as far away as Syracuse.

Texaco lubricates 80% of the job as...

Niagara team wrestles 42 million yards of

"Dirt" is flying on the Niagara Project — over 42 million cubic yards of it. Piled into a mountain it could more than bury the Empire State Building. This gives some idea of the tremendous scope of the operation—exceeded only by the St. Lawrence Seaway in the roster of the world's construction projects.

Almost a billion dollars will be spent before the thirteen great turbine-generators of the Niagara Generating Plant start producing power in mid-1962. Before that date arrives, four massive construction projects must be completed, whole villages moved, railroad yards and transmission lines relocated, and a 2,460-acre reservoir dug.

The size of the problems match the size of the project. Everything from Indian rights to tourist convenience has had to be considered by the Project heads. Furthermore, each contractor has special difficulties of his own to face. Merritt-Chapman & Scott Corporation, for example, building the Niagara Generating Plant, has had to push the base of the 1,100 foot plant 300 feet back into the cliff because the river bed drops too sharply to allow for the usual built-out coffer dam. Balf-Savin-Winkelman, with a large section of water-conduit to construct, is blasting through solid rock all the way along its share of the 4-mile project.

4 out of 6 projects are Texaco-lubricated

Texaco lubricants — and the Texaco Simplified Lubrication Plan — are proving their worth on 4 out of the 6 major jobs at Niagara. At the intake, along the conduits, at the reservoir site and at the Niagara Generating Plant itself, just eight Texaco lubricants are doing 100% of the lubricating jobs. This simplification of lube requirements is saving Texaco's contractor customers a signifi-

THE INTAKE, 5 miles upstream from the Niagara Generating Plant, will scoop up 50,000 cubic feet of water with its two harmonica mouths every second it operates at full capacity. Merritt-Chapman & Scott Corp. has a $66-million contract for the job.

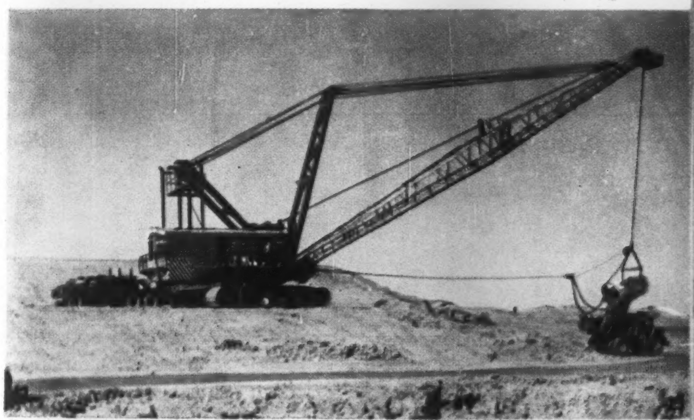
THE WATER CONDUITS, 46′ wide, 66′ deep, stretch 22,000 feet through heavily industrialized area, feature unique hinged arches to counteract rock movement. Merritt-Chapman & Scott and Balf-Savin-Winkelman are tackling major portions.

rock and overburden

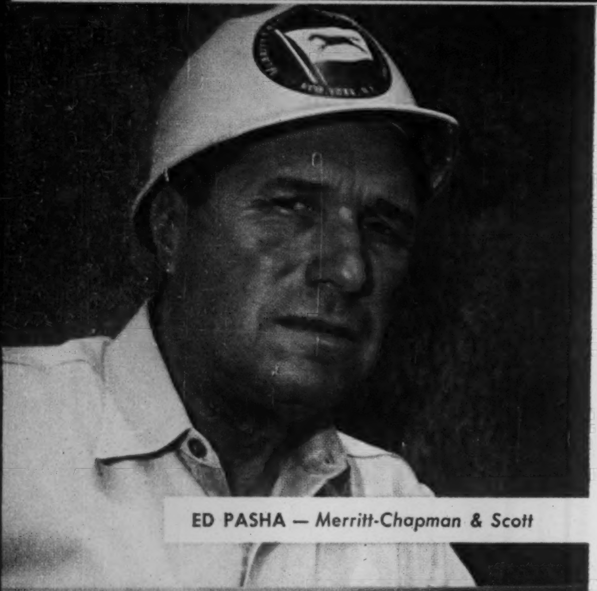
cant amount in terms of reduced inventory expense, minimized danger of misapplication and slashed purchasing costs. A Texaco team of engineers was present at all times for consultation and practical service.

These are the 8 Texaco Lubricants on the Project

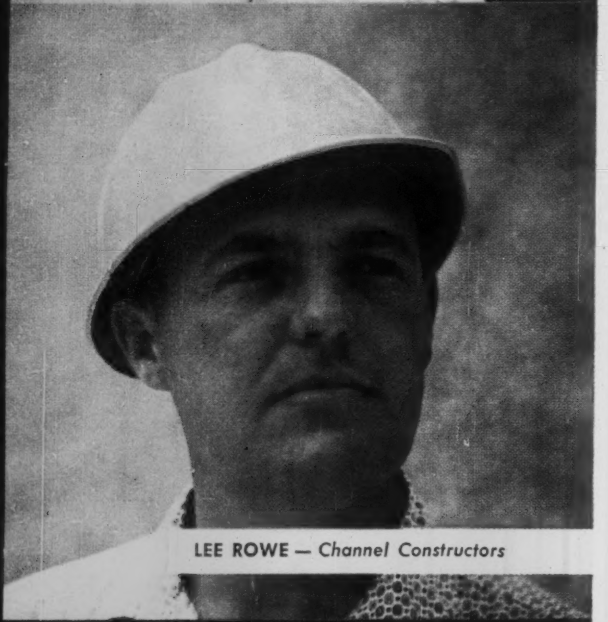
Havoline Motor Oil }
Ursa Oil Super Duty } — for engines
Regal Oil (R&O) — for hydraulic systems and air compressors
Marfak Multipurpose — for chassis, wheel bearings, general grease lubrication
Crater — for wire rope and open gears
Universal Gear Lubricant EP
Rock Drill Lubricant
Track Roll Lubricant



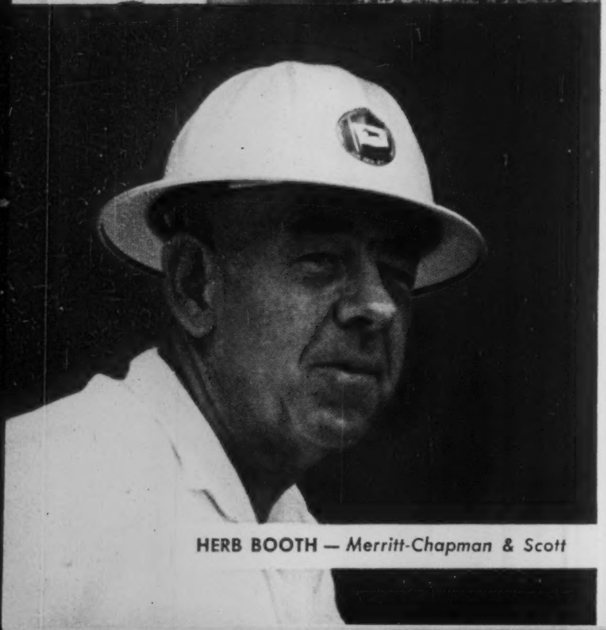
LUBE RIG SPEEDS OPERATION on Niagara job by bringing Texaco lubricants right to the locations where they are needed. With just eight lubricants for the whole job, this contractor can service any piece of equipment with the same rig.



ED PASHA — *Merritt-Chapman & Scott*



LEE ROWE — *Channel Constructors*



HERB BOOTH — *Merritt-Chapman & Scott*

Here's what TEXACO'S customers are doing:

THE INTAKE is a $65,962,254 job assigned to Merritt-Chapman & Scott. Bossed by Ed Pasha, Project Manager, Merritt-Chapman & Scott construction crews are building two harmonica-type intakes each 840 feet long plus a 1000-foot adjoining upstream wall. Before work could be started on the intake structures themselves, Merritt-Chapman & Scott had to build a 3,000 foot cofferdam out into the Niagara River. Other River work will eventually include a 500 foot wide channelization of the bottom for 7,000 feet downstream of the intake structure.

THE WATER CONDUITS will run for about 4 miles through a heavily industrialized area. Balf-Savin-Winkelman, assigned to 9,000 feet of the work, has already finished digging its way through the rock, is now beginning on the bottom slabs.

THE RESERVOIR, assigned to Channel Constructors on a $31,855,000 contract, will cover more than 2400 acres. Lee Rowe, Project Manager, expects to move 9½ million cubic yards of rock and overburden before the job is completed. In addition to the reservoir, Channel Constructors have the job of digging out the open cut part of the waterways system and supplying all the aggregate used on the entire Niagara Project.

THE NIAGARA GENERATING PLANT at Lewiston is probably the most dramatic part of the Project. Under the direction of veteran project manager Herb Booth, Merritt-Chapman & Scott crews have already carved almost 10 million cubic yards of rock out of the 314-foot cliffs below the Falls. The purpose of this monumental excavation is to provide a platform and spillway 300 feet deep and 1,840 feet long for the 13 huge turbine-generators. When finished the $99,000,000 Power Plant will have an installed capacity of almost 2,000,000 kw.

Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

TEXACO

Throughout the United States
Canada • Latin America • West Africa

this year. During the first half of '59, federal aid highway projects across the country attracted an average of more than seven bidders per contract, and prices averaged about 11% below engineers' estimates.

One reason for sharp competition and prevailing low unit prices in the highway field is the continued improvement of construction machinery and methods. During 1959, these new or improved machines or techniques made their appearance:

- The triple-drum concrete paver, said to have 40% more productive capacity than the dual-drum units it is intended to replace.
- Slip-form pavers, used for the first time on highway jobs in California and North Carolina.
- Mass production of concrete from a centralized on-site mixing plant, as at Dulles International Airport.
- A new tandem "piggyback" rubber-tired scraper, introduced late in the year.
- Extensive ripping and scraper handling of soft rock and hard soil deposits, previously drilled and blasted.
- Improved subgrade leveling and finishing devices, intended to provide more precise results than is possible with present tools.

This year will bring further improvements in equipment and methods—generally in the direction of bigger, faster, more powerful and more productive machines and more economical methods. Encouraging to many contractors is the growing use of "end-result" specifications on highway work. Under this type of specification, the contractor is more nearly free to use his ingenuity as to equipment and methods to be employed, provided only that the required end result is attained.

Developing trends and problems in bridge design and construction—evident in 1959 and expected to continue in 1960—include these:

- Increased use of high-strength steel, primarily because of savings in weight of material.
- Emergence of aluminum as a structural material for bridges. Two small aluminum girder bridges were built by the New York Department of Public Works on Long Island; and scheduled for construction this year are two structures incorporating sheet aluminum members.

Growing use of prestressed concrete already well established for short spans, continuous prestressing techniques are now being applied for longer spans.

- More and more composite designs in structures of various lengths.
- Installation of fluorescent luminaires in railing on deck-type highway bridges.

U. S. 40, CALIFORNIA—**Five sections of U. S. Highway 40, total length of 58 miles, reached full freeway status in 1959, leaving 35 miles to go.**

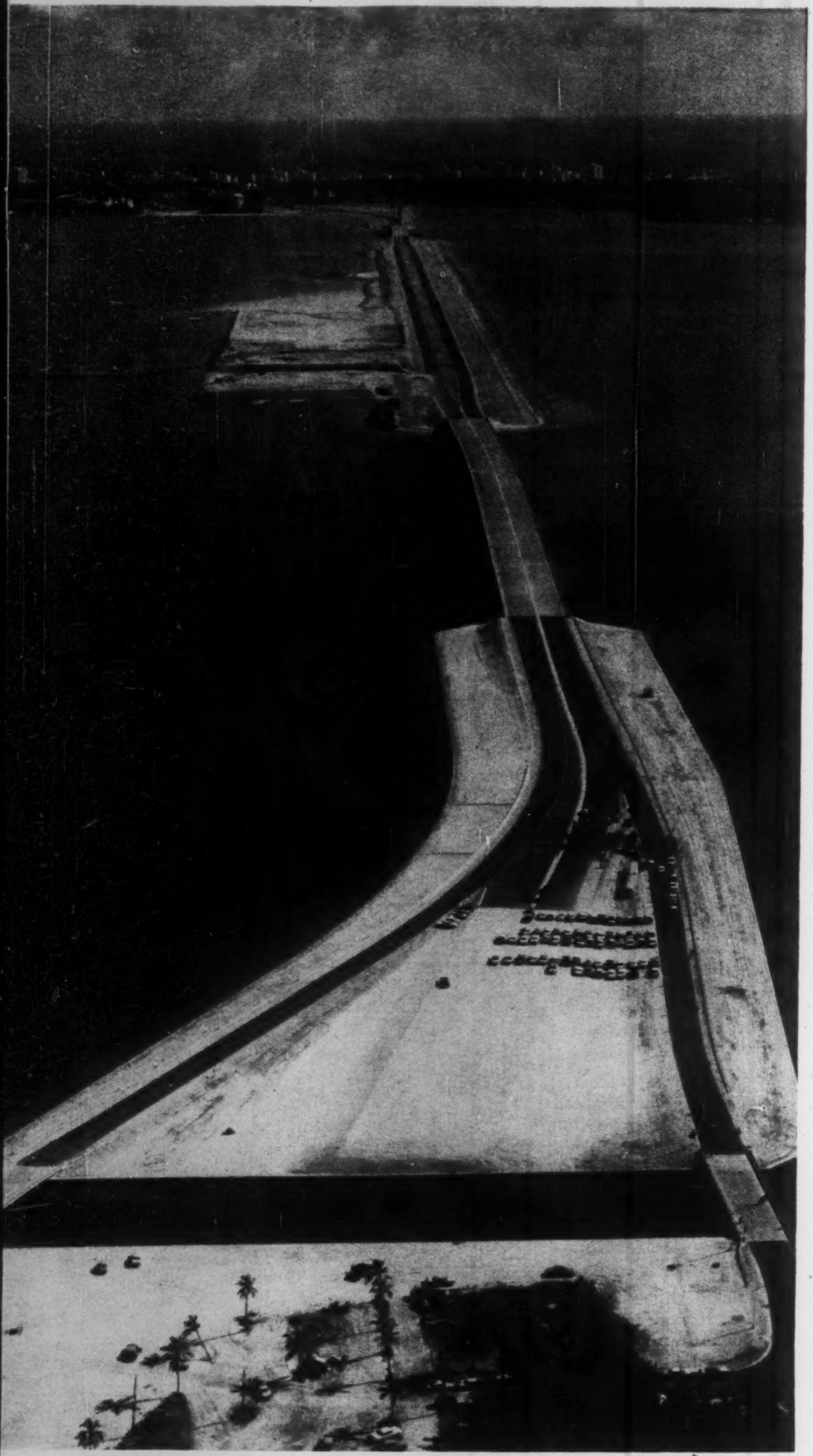
Dominating the airport scene is the continuing effort to modernize the nation's major commercial airfields to accommodate jet aircraft and the growing number of air travelers.

Under present legislation, federal aid to airports is pegged at $63 million for fiscal 1961, beginning July 1. This is the same as for fiscal 1960. Continuing a major shift in policy announced last year, federal aid will be authorized only for runways, taxiways and other items essential for safe operations (not airport terminal buildings). And federal money will not support construction of runways longer than 10,500 ft (at sea level). No major change in airport legislation is expected this year.

Interest grows in the use of flush runway centerline lights as an aid to safety during landings and take-offs. Experimentally in use in various locations, flush lights are being installed at New York's International Airport. Newest type is a flat "pancake" light, 6 in. in diameter, being tested on both runways and taxiways at the National Aviation Facilities Experimental Center at Atlantic City. High-speed taxiways are here to stay and are being built into the nation's jet terminals.

The asphalt vs. concrete runway battle has died down, for the time being, at least. No major changes are expected in present Air Force policies, the center of controversy a year ago.

Inextricably linked with the urban transportation problem are various pro-



JULIA TUTTLE CAUSEWAY—Miami's new three-mile, six-lane, $14-million causeway opened last year. It carries up to 25,000 vehicles daily.

posals for new or improved rapid transit systems and the freeway vs. mass transportation controversy.

Current center of the freeway-mass transportation argument is San Francisco, where comprehensive plans for a $700-million Bay Area rapid transit system are approaching the action stage. Early last year, in a surprise move, the city's Board of Supervisors flatly opposed construction of seven out of 10 proposed freeways.

Major expansion or improvement projects on rail rapid transit systems are planned, under construction or completed in several of the nation's largest cities, including Chicago, Washington, Cleveland, New York and Boston. Preliminary planning is under way in the cities of Philadelphia, New Orleans, Detroit, Los Angeles, Pittsburgh and Seattle.

Scheduled for completion this year is a $5-million monorail from Seattle's business district to a future exposition site, one mile away.

Construction of bases for intercontinental ballistic missiles will continue to expand. The Department of Defense may allocate as much as $450 million to base-building for the fiscal year beginning in July.

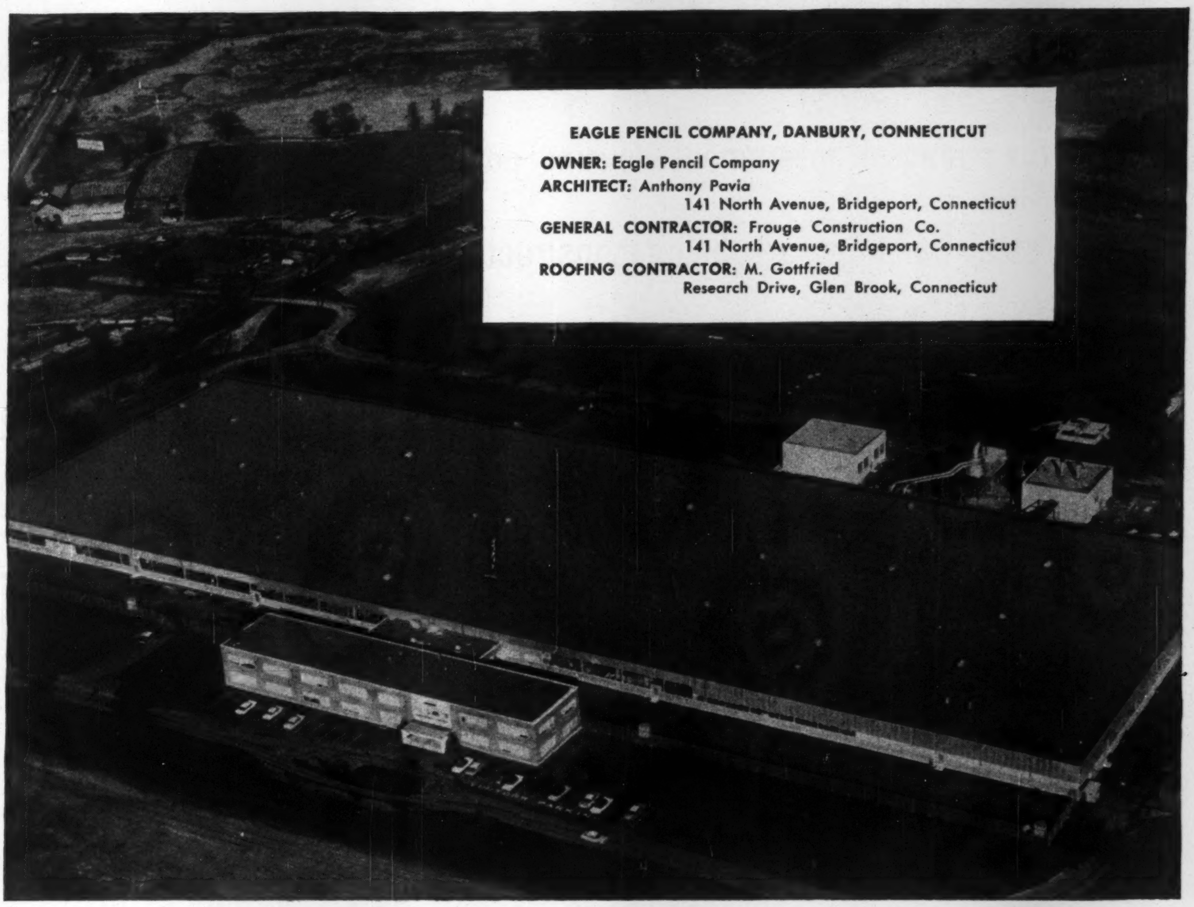
The Pentagon is authorizing not only more bases, but also more expensive bases.

The first launching site for Atlas ICBMs had a cluster of six launchers within a small area. Now the accent is on dispersion. The Air Force spread out to a three-launcher complex and is now building each launcher as a unit, far from any other launcher.

Additional protection is scheduled for the Atlas launchers. Atlas bases now let call for launchers that are either partially buried or shielded by earth embankments. Dispersion and protection against attack make for more costly projects.

The Air Force will push harder on construction of bases for the 100-ton Titans, despite the fact that the Titan isn't fully developed. Pentagon officials want to have underground bases ready for the Titan when the manufacturers declare it ready for use. A base for a squadron of nine Titans squadrons runs about $26 million, twice the price of an Atlas installation.

There is a possibility that contracts for a few underground silos for the Minuteman ICBM will be let by the end of the year. These units will be little more than extremely precise concrete-lined holes in the ground. They'll cost much less to build than launchers for the Atlas and the Titan. But, when the Minuteman program gets under way in 1961 and 1962, there'll be many more of them.



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ASPHALT AND ASBESTOS BUILDING MATERIALS

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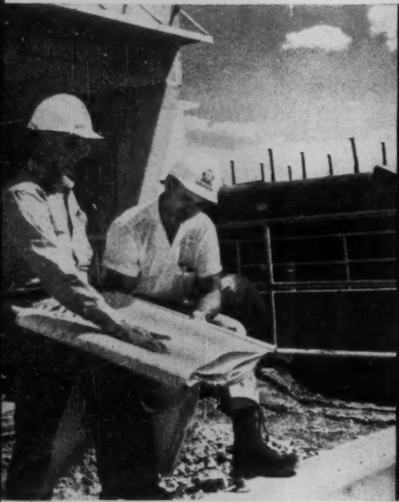
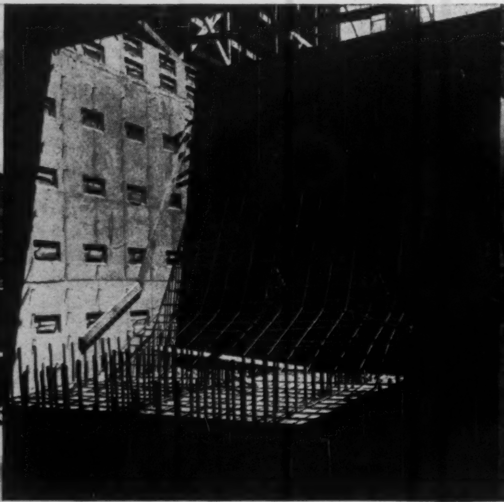
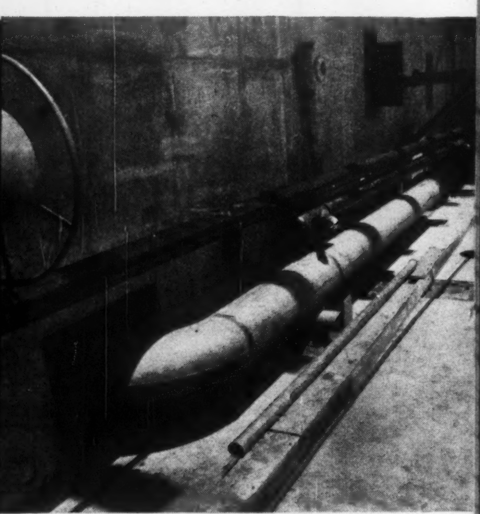
Somewhere east of Laramie, on one of Wyoming's plains, you'll find the strangest government housing project ever built. Six concrete and steel buildings are being constructed to house Atlas missiles. The site is one of the operational intercontinental missile bases to be operated by the Strategic Air Command. This base is being constructed on the surface. Follow-on bases will burrow deep into the earth. In all these systems, the Air Force puts much emphasis into ground support equipment. Virtually all steels required can be purchased from one firm — United States Steel. Whether it's carbon



The U. S. Army Corps of Engineers is constructing this operational intercontinental missile base in Wyoming. In front of the partially completed Launch and Service Buildings are Col. Sidney T. Martin, in charge of construction, and Maurice K. Graber, a construction engineer for the Corps.



This is the inside of the blast pit of one of the launcher buildings. In all six of these buildings there are 1,040 tons of structural steel, 1,950 tons of reinforcing steel, over 48,000 tons of concrete aggregate, blocks and cement, and 8,040 tons of mechanical steel items.



Fuel lines and process piping are Stainless Steel and operate at pressures up to 15,000 psi. The pipes are kept almost surgically clean to prevent contamination of fuel and subsequent malfunction. Vapor degreasing and chemical cleaning processes are used on the pipes.

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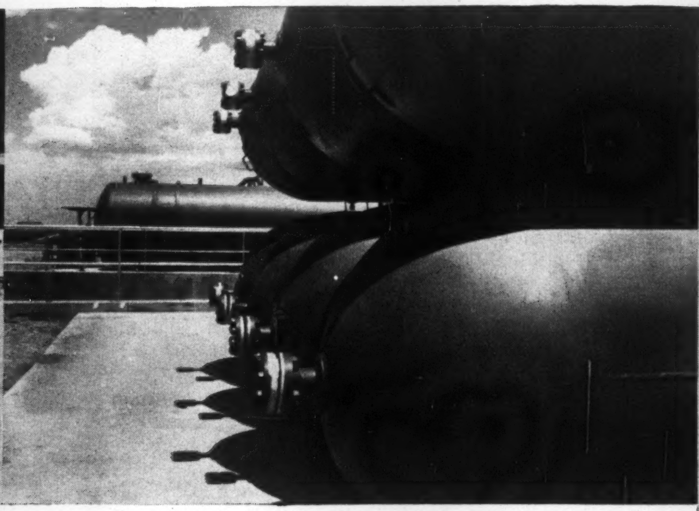

The Atlas is powered by a cluster of liquid propellant rocket engines that burn liquid oxygen and RP-1, a kerosene-like hydrocarbon fuel. 192 pressure tanks fabricated from alloy or Stainless Steel plate at this site store liquid and gases—liquid oxygen and nitrogen and helium gases which are used to inject the fuels into the missiles.

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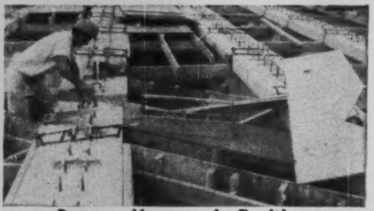
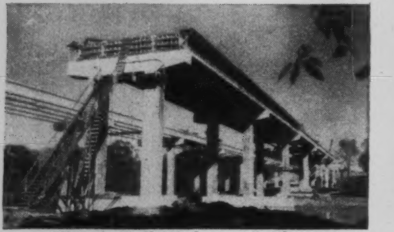
Interstate Highway Bridge—Iowa


Prescon Hangers in Position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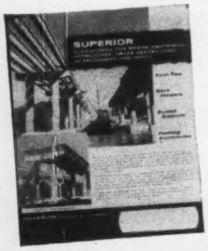

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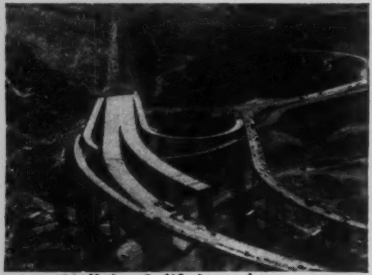
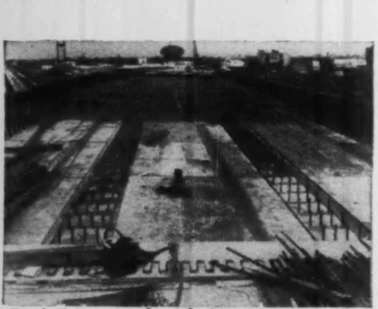

Vallejo, Calif. Interchange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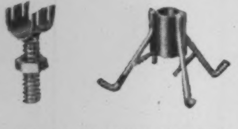
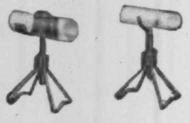
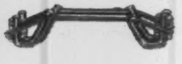
Chicago-Calumet Skyway


HEAVY-DUTY SCREED SUPPORTS


SCREED CHAIRS

HANGER FRAMES


Coil Hanger Frame

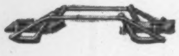
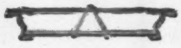
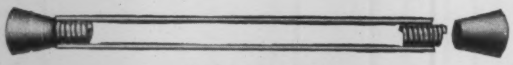
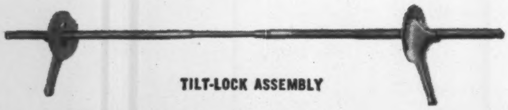


Plate Hanger Frame


Prescon Hanger


CONE-FAST COIL TIE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Major Transportation Projects

TWIN STEEL ARCHES carry New York's 175-mile Northway over the Mohawk River. The $275-million expressway will connect the New York State Thruway at Albany with Canadian border. First section, a 5½-mile stretch, was opened last autumn.

New England

• **Massachusetts Transit Authority**—Conversion of 9.4 miles of the abandoned Boston & Maine Railroad line to high speed rapid transit was completed in July at a cost of $8.6 million. Running from the center of Boston to Newton, the project is an apparently successful attempt to convert a nonpaying railroad line into rapid transit.

• **Boston vehicular tunnel**—Construction has begun on the $29-million second vehicular tunnel under Boston harbor, paralleling the existing Sumner Tunnel. Also planned is the refurbishing of the existing tunnel; both projects are under the control of the Massachusetts Turnpike Authority. Completion of the new tunnel is scheduled for 1962.

• **Providence expressway**—Two links in a limited access expressway through the center of Providence, R. I., were opened late in 1959. They are the $9-million East Providence Expressway and the $7.5-million Huntington Avenue Expressway. In 1960, initial contracts will be awarded for two sections of the $21.5-million North-South Freeway.

• **Connecticut expressways**—Major expressway projects include 15 miles of 4-lane divided expressway (Interstate 84) between Danbury and Newton (total cost $22.9 million); 9 miles of the Hartford-Springfield Expressway (Interstate 91, $12.5 million); and a $9.5-million interchange between routes 84 and 91 in the city of Hartford. These projects will be completed in 1961 and 1962. Scheduled for completion early in 1960 is the Oak Street Connector in New Haven, focal point of that city's redevelopment program.

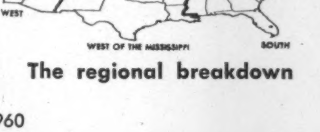
Middle Atlantic

• **Arthur Kill Bridge**—This vertical lift railroad bridge, with a lift span of 558 ft, longest in the world, has been completed. The bridge crosses one of Port of New York's busiest shipping arteries and connects Elizabeth, N. J., and Arlington, Staten Island, N. Y. It was built by the Baltimore and Ohio Railroad.

• **Delaware Expressway**—Construction is expected to start this summer on a $30-million stretch from Philadelphia to the Pennsylvania Turnpike. Eventually, the expressway will extend from the eastern terminus of the Turnpike to the Delaware state line, following along the Delaware River; total cost is estimated at $300 million.

• **Fort Pitt Bridge**—This $16.5-million double-deck structure spanning the Monongahela River at Pittsburgh was completed in 1959. It is a principal link in the Penn-Lincoln Parkway; only the adjacent Fort Pitt Tunnel, now under construction, must be finished to complete the Parkway.

• **Delair Bridge**—Completion of this $12-million vertical lift railroad bridge is scheduled for spring, 1960. It will carry Pennsylvania Railroad trains on a double-track span over the Delaware River between Philadelphia and Delair, N. J. The lift span is 542 ft long and will have a 135-ft clearance.



The regional breakdown

• **York Bypass**—The Pennsylvania Department of Highways has completed a 4-lane divided highway 7 miles long at a cost of $12 million, providing the final link in Interstate 83 connecting Harrisburg, Pa., and Baltimore.

• **Andrews Air Force Base**—Major improvements at this Maryland base include grading, drainage and paving. Estimated to cost $19.5 million, work began early in 1959 and is scheduled for completion by the end of 1960.

• **Anacostia Freeway**—This District of Columbia development has an estimated cost of $32.5 million; it is a freeway on the Interstate System, including 3 major interchanges and 21 structures. Started in 1957, its estimated completion date is February 1966.

• **Southwest Freeway**—Work continues on this $53-million elevated freeway on the Interstate System in the District of Columbia, including major crossings over the Washington Channel and Potomac River. Started in 1957, estimated completion date of this urban complex is June 1963.

• **New Jersey expressways**—Major projects underway by the New Jersey State Highway Department include the Route 21 Freeway, a 6-lane facility between Paterson and Newark; a 6-lane, 4.8-mile section of Interstate 287 in the Raritan Valley; 6.5 miles of 4 to 6-lane freeway on Interstate 295 in the Camden area; 4.8 miles of 4-lane expressway on Interstate 78 in the Jug Town Mountain section of western New Jersey and a 12-mile section of Interstate 80 near Dover. Total cost of these projects is nearly $65 million.

• **Schuykill Expressway**—Final links in this $75-million expressway have been completed, providing a 4-lane expressway connection between southern New Jersey to the Pennsylvania Turnpike by way of the City of Philadelphia.

• **The Northway** — Five and one-half miles of this 175-mile New York State expressway were completed last year and five contracts with a total worth of $15 million were let. This $275-million route will extend from the Thruway at Albany to the Canadian border in Clinton County.

• **Long Island Expressway**—More than $13-million worth of contracts were let in 1959 for work on the Long Island Expressway. This $217-million, 86-mile interstate highway will run from the Queens Midtown Tunnel to eastern Long Island.

• **Dulles International Airport** — Construction of the international airport for Washington, D. C., was 30% complete by the beginning of 1960. The site was cleared, graded and drained. Two 11,000-ft runways and parallel taxiways were completed. Work began on a 10,000-ft runway with a 10,000-ft taxiway; a parking apron, and an access road. Contracts will be let this year for a 25-mile access highway, an 800 x 4,000-ft parking apron, a utilities system and the terminal building.

The $85-million airport, located about 25 miles west of Washington, D. C., will be the world's first airport to be designed for commercial jet aircraft. Mobile lounges will be used to carry passengers between aircraft and the terminal building. The Federal Aviation Agency plans to finish the project by mid-1961.

• **George Washington Bridge**—Preparations for the addition of a six-lane lower deck and construction of approaches were begun last year. The Port of New York Authority's $183-million program is scheduled for completion in 1962. Contracts for sections of the New York and New Jersey approaches will be let in 1960.

BANFIELD FREEWAY takes express traffic from congested areas of Portland, Ore.

• **Throgs Neck Bridge**—Construction of main span towers and approach viaduct piers and work on the erection of approach viaduct steel brought the $90-million Throgs Neck Bridge to within 46% of completion. Contracts for all remaining construction on the suspension bridge between Queens and the Bronx will be let this year by the Triborough Bridge and Tunnel Authority. Estimated completion date is 1961.

• **Narrows Bridge** — The Triborough Bridge and Tunnel Authority will let major contracts this year for construction of the $320-million Narrows Bridge. Only preliminary site preparation was done last year. Construction on tower piers and anchorages will begin in 1960. The bridge, which will link Brooklyn and Staten Island, will have the world's longest suspension span, 4,260 ft.

• **LaGuardia Airport**—The airport's $56-million reconstruction and improvement program will be completed by 1962. Almost $12 million will go for public landing areas, including construction of a new runway and reconstruction of an existing runway.

• **New York International Airport (Idlewild)**—The $12-million instrument runway 4R-22L was completed in October last year. It is the first commercial runway in the world to have flush narrow gage light, and flush centerline lighting in addition to conventional runway edge lighting.

• **Brooklyn piers** — The Port of New York Authority completed three piers with a total value of $21.2 million on the Brooklyn waterfront last year. Work on Pier 6 began late in 1959. Contracts for substructure and deck, pier shed, paving and utilities will be let on this $5.6-million, finger pier in 1960.

• **New York City expressways**—Three projects with a combined length of 2.1 miles and a total cost of $23.5 million were under construction last year on the $120-million, 5.4-mile **Cross Bronx Expressway.** A demolition contract was let in 1959 as the first work on the **Gowanus Expressway,** which will extend the 5.1 miles from the Brooklyn Battery Tunnel to the Brooklyn approach to the Narrows Bridge. This expressway will cost $83 million.

Three major contracts with a combined value of $18.5 million will be let this year for work on the **Clove Lakes Expressway.** This 6.8-mile, $36-million route on Staten Island will link the Goethals Bridge with the Narrows Bridge.

The final Brooklyn link in the $120.4-million **Brooklyn-Queens Expressway** was completed early this month. The 10.6-mile, six-lane highway connects Brooklyn Battery Tunnel Plaza with the Grand Central Parkway near LaGuardia Airport. Only a 3,700-ft section in Queens remains to be built.

About $15 million worth of contracts are under way for completion this year of the **Throgs Neck Expressway** and **Cross Bronx Expressway Extension.**

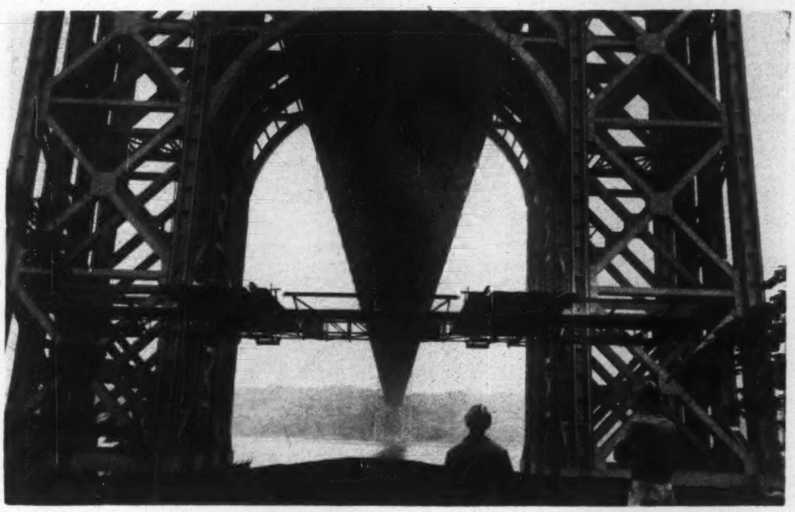
• **Empire Stateway**—New York State opened 28 miles of this 175-mile expressway to traffic last year, and let eight contracts with a total value of $18 million. Total contracts completed or under way amount to $75 million and cover 91.08 miles. The $325,-million expressway extends from the Pennsylvania line to Binghamton and north to the Canadian border.

South

• **Virginia expressways**—Major expressway projects in progress include three sections of Interstate 81, totalling about 35 miles; two sections (23 miles) of Interstate 95; and 6.5 miles of the Washington circumferential route. Completed in 1959 were the Emporia Bypass, Interstate 64 in Newport News, and final sections of the Lynchburg Expressway.

• **Georgia expressways**—Construction is 75% complete on the North-South Atlanta Expressway; estimated total cost of development, including 18 miles of main expressway, is $65 million. Scheduled for completion early in 1960 are 36 miles of Interstate 75 in south Georgia at a cost of $16.5 million.

• **Fort Lauderdale Tunnel**—The $6.5-



GEORGE WASHINGTON BRIDGE—Workmen inspect the first of four platforms installed for placement of 76 steel sections for a six-lane lower deck.

million four-lane vehicular tunnel under the New River on U.S. 1 in Fort Lauderdale, Fla., will be open to traffic early in 1961.

- **Miami's 36th Street Causeway**—The 3-mile causeway connecting Miami and Miami Beach was opened to traffic in December. Costing $10 million, it is the first link in an elevated expressway that will extend to Miami's International Airport.

- **Alabama expressways**—Scheduled for completion in 1960 are nearly 7 miles of Interstate 65 in Mobile and 56 miles of the same route between Atmore and Garland.

- **Louisiana expressways**—Major projects in the New Orleans area include the Pontchartrain Expressway, about 3 miles of 6-lane urban construction, and the Little Woods-Lake Pontchartrain route, which involves some 8 miles of hydraulic fill. The New Orleans approach to the new Mississippi River bridge was completed this year, total cost $10 million.

Middle West

- **Ohio expressways**—Scheduled for completion in 1960 are several sections of urban and rural expressways including portions of the Columbia-Medina Expressway (total cost, $94 million); the $7.5-million North Expressway in Toledo; the $7-million Canton Expressway; the $20-million Goodale, Sandusky and South-West Freeways in and around Columbus; the $9.5 million North Dayton Expressway; and the $45-million Cleveland-Conneaut Freeway. Major work is underway on the Cleveland Innerbelt and connections.

- **Edsel Ford Expressway**—Final section of the Edsel Ford Expressway in Detroit was opened to traffic in December 1959. This section is 4.9 miles in length and cost $40 million. Total cost of the 14-mile road was $141 million.

- **Walter P. Chrysler Expressway**—Preliminary work has started on the Walter P. Chrysler Expressway in Detroit and contracts are expected to be awarded for the first 4.5 miles at an estimated cost of $71 million. When completed, it will join the Lodge Expressway to form a loop through the heart of the city.

- **Detroit-Chicago Expressway**—An additional 38 miles of this major route (Interstate 94) were opened to traffic in December 1959. To date 115 miles of the 217-mile Michigan portion of the route have been completed, another 62 miles are under contract, and 40 miles will be placed under contract in 1960. The entire expressway is scheduled to be completed in 1961.

- **Houghton-Hancock Bridge**—This $11-million vertical lift, combination railroad and highway bridge was completed in December 1959. Connecting the cities of Hancock and Houghton in Michigan's Upper Peninsula, it spans the Portage Canal and is the only crossing to the Keweenaw Peninsula.

- **Chicago bridges**—Contracts totaling $10 million were awarded last year for the construction of new bridges and viaducts, and the modernization of existing structures. About $18 million worth of this construction will be awarded this year. Major bridges under construction include the new Dearborn Street bridge over the Chicago River, a four-lane bascule bridge at Harrison Street, and a 4-lane fixed river bridge at Fullerton Avenue.

- **Chicago expressways**—During 1959 the Chicago Department of Public Works awarded $2.8 million worth of construction contracts on the South Route of its expressway system, and $6.1 million on the Northwest Route. Construction contracts totaling $5 million were completed last year. All construction contracts on the Northwest Route have now been awarded, and are scheduled for completion this summer. About $20 million worth of contracts will be awarded for construction on the South Route this year.

The first section of the Northwest Route was opened to traffic last September. Largest single project, now 85% completed, is an $18-million railroad grade separation structure being built under five contracts. New work to be started this year on the South Route includes 8 major bridges between Congress Street and 39th Street.

Last year the Cook County Highway Department awarded $13 million of contracts for expressway and allied construction in the Chicago area; and completed $41 million worth of contract work. This year it expects to place under contract $54 million of expressway construction and $21 million of primary road construction.

- **O'Hare Field, Chicago**—Two hangars for commercial jet planes and a major runway extension are under construction at Chicago's O'Hare International Airport. Both hangars will be completed by October 1960, and the runway extension some time this spring.

One of the hangars, being built for United Airlines at a contract cost of $4.6 million, features prestressed steel cantilever roof trusses. The other features double cantilever roof trusses with 160-ft span cantilevers.

The runway construction includes extending existing 8,838-ft Runway 14R-32L to 11,600 ft, under a $4.4-million contract. All subgrading has been completed and embankment construction is continuing through the winter, as weather permits. Concrete paving will get underway early this year. The contract also includes a 4,700x75-ft jet taxiway, a 1,500-car parking lot, a warm-up apron for jets, runway lighting, drainage facilities, road construction.

- **Duluth-Superior Bridge**—This $20-million high level bridge will cross St. Louis Bay and provide a 4-lane roadway connecting Duluth, Minnesota, and Superior, Wisconsin. Initial contracts were let in November 1958 and the structure is scheduled for completion late in 1962.

West of Mississippi

• **Missouri urban expressways**—Major work continues on the Mark Twain Expressway and other urban road projects in St. Louis. Opened to traffic in 1959 was a 1.1-mile section of the Mark Twain Expressway, construction cost $4 million. Scheduled for completion in 1960 is a 1.3-mile $5.5-million section of the Crosstown Expressway in Kansas City.

• **Texas expressways**—Last year 712 contracts totaling $254 million were awarded and $274 million worth of construction was completed on the Texas Highway Department's vast expressway system. About 600 construction contracts will be awarded this year, costing $253 million. This includes $65 million worth of state highways and farm-to-market roads not on the federal aid system. On Dec. 1, 1959, Texas had completed to full or acceptable standards and opened to traffic 377 miles of interstate highways. An additional 166 miles had been completed to interstate highway standards adequate for present traffic. Active expressway construction underway on that date totaled 340 miles, while 1,475 miles were in preliminary engineering and right-of-way stages.

• **Corpus Christi Bridge**—Opened to traffic in October 1959 was the $9-million bridge across the ship channel at Corpus Christi, Texas.

• **Minneapolis-St. Paul expressways**—Work is completed or under way on 24 miles of urban expressways in the Minneapolis-St. Paul area. Scheduled for completion in 1960 is the $4.5-million South St. Paul-Newport Bridge.

• **ICBM bases**—Launching and service installations for six Atlas intercontinental ballistic missiles were completed last year at **Warren Air Force Base,** near Cheyenne, Wyo. Work on nine other launchers under a $12-million contract is 70% complete. Construction of a third squadron, containing nine launchers, started in December.

Construction of underground facilities for 18 Titan ICBMs at Lowry **AFB,** outside of Denver, Colo., is 20% done. Installations for the first nine missiles will be completed in April 1961, and for the second nine-missile squadron the following June. The entire project will cost $90 million.

At **Offutt AFB,** Omaha, Neb., builders have completed 50% of the work on three Atlas launching sites with a capacity of three missiles each. The $13-million contract is scheduled for completion in April.

MULTIPLE BRIDGE over Los Angeles River is part of Santa Monica Freeway.

Construction will start this spring on a $45-million base for Atlas ICBMs at **Lincoln AFB,** Lincoln, Neb.

Corps of Engineers awarded a $28-million contract in December for construction of three underground launching complexes at **Ellsworth AFB,** Rapid City, S. D. Each complex will house three Titans.

Two contracts with a combined value of $15-million for nine Atlas launchers at **Forbes AFB,** Topeka, Kan., are about 40% fulfilled. About $1-million worth of contracts will be let this year for work at Forbes.

Far West

• **ICBM bases**—The $25-million base for launching nine Atlas intercontinental ballistic missiles at **Fairchild Air Force Base,** Spokane, Wash., is 40% complete. About $1.4 million worth of work for support buildings will be let this year. Corps of Engineers plan to complete the base in October or November.

Construction started late last year on the $46-million, underground Titan ICBM base at **Larson AFB,** Moses Lake, Wash. March 1962, is the scheduled completion date.

Work will begin early this year on two $45-million Titan bases, one at **Mountain Home AFB,** Mountain Home, Idaho, and the other at **Beale AFB,** Marysville, Calif.

• **Salt Lake railroad fill**—This 13-mile, $49-million earthfill causeway was completed last year, after four years. Owner is the Southern Pacific Railroad.

• **Bremerton Drydock**—First increment of one of the world's largest drydocks at Puget Sound Naval Shipyard is scheduled for completion in 1962. Expected to cost $32 million, the drydock will be 1,152 ft long, 180 ft wide and 61 ft deep.

• **Tacoma-Seattle-Everett Freeway**—The first 2-mile section of this 55-mile, $230-million freeway was opened in 1959. Piers were completed for the $16-million double-deck bridge over Lake Washington Ship Canal in Seattle.

• **Hood Canal Bridge**—Work has been suspended until spring on the $16-million floating bridge over the Hood Canal, an arm of Puget Sound. It has a 6,500-ft floating span, and is 75% complete.

• **R. H. Baldock Freeway**—Work continues on the $10.5-million final link in the 43-mile Portland-Salem Freeway. Final six miles is located in the Portland urban area, is 75% complete, and will be finished in 1961.

• **Oregon Interstate routes**—Major work is in progress on Interstate Routes 5 and 80N in Oregon. Included is the 42-mile, $25.5-million Albany-Eugene section of Route 5, now 75% complete.

• **Oregon Coast Highway**—Some of the heaviest grading work ever seen in Oregon is part of the $12.6-million Myers Creek-Brookings Section of the Oregon Coast Highway (U. S. 101). Within this 15 miles of new location are cuts and fills over 300 ft in height. One 3.21-mile section has more than 4 million cu yd of excavation.

• **Benicia-Martinez Bridge**—Scheduled for completion in 1962, construction has begun on this $20-million, 6,215-ft, four-lane deck truss bridge.

• **San Francisco International Airport**—$25 million of work is scheduled over the next several years at SF's International Airport. In 1959, some $5 million was spent on runway extensions and improvements. Future work will include an $8-million terminal building and additional runways.

• **Webster Street Tube**—Started in October 1959, construction of this two-lane vehicular tunnel between Oakland and Alameda is scheduled to take three years. Estimated to cost $16.5 million, it will parallel the existing Posey Tube. To build the tunnel, concrete sections will be precast, floated to position, sunk, and joined underwater.

• **Embarcadero and Central Freeways**—In San Francisco, a 1.4-mile, $7.8-million segment of the Central Freeway was completed; eventually, this route

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- Entire wire and rope mill operations are concentrated on the making of wire rope in a thousand and one sizes, grades, and types . . . to give you the rope you need.

Result: Whyte Strand wire rope is literally "custom made" for shovel hoist rope, dragline, clamshell crane rope, boom hoist line, dozer rope, scraper rope, contractors' hoist and derrick rope, overhead cranes, cableway excavators, and winch lines. If you'd like to check the type of rope recommended for your equipment, send for bulletin 5702 — free for the asking.

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Lima announces new 5-yd. shovel, 140-ton special crane

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- Converts to 112-ton crane
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Lima Type 1800 5-yd. shovel—one of five Limas owned by Mittry Construction, Los Angeles. Shown excavating at Abiquiu earth fill dam project, Shama River, N. Mex.

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STARTS FAST with push-button ease. Conveniently grouped controls simplify operation.

(Right) **TRIM BUT ROOMY** enclosure protects engine and compressor unit—provides ample space for carrying and safeguarding tools.

The new Le Roi 75 Rotary is as close as you can get to carefree on-the-job air power. It's slimmed down to its working best — to give a profitable account of itself on small heavy-duty jobs that call for 75 cfm of air at 100 psi.

This bantam rotary is trim, light, and compact for easy handling and for efficient, low-cost operation. You can tow it anywhere with truck or auto. And it's so perfectly balanced that one man can move it around the site quickly and easily — tools and all!

Spring the modern aluminum flip-top hood if you want to see the latest in space- and parts-saving design! The single-stage rotary is direct-coupled to a 4-cylinder, water-cooled engine. You get such top-performance and long-life features as automatic speed-pressure regulation and oil-temperature control — 12-volt electric starting — separate engine and compressor cooling systems — generous ventilation — and better, easier access to all parts than ever before possible on *any* portable air compressor!

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here's dependable air power with a flip-top hood.

FLIP-TOP HOOD opens all the way for fast, unobstructed adjustments or servicing.

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will link Bayshore with the Golden Gate Bridge. The 1.2-mile, $7.8-million Embarcadero Freeway, from the Bay Bridge approaches to Broadway, was completed early in 1959.

• **Bayshore Freeway**—Scheduled for completion this year are additional segments of the Bayshore Freeway, which eventually will extend from San Francisco to San Jose, a distance of 50 miles. Current projects are the $8.1-million Alemany interchange and a 4.4-mile freeway section.

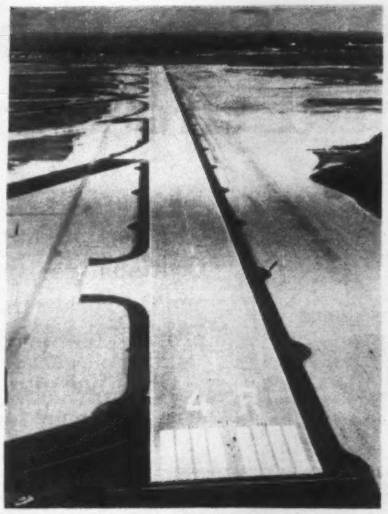
• **Los Angeles International Airport**—Work continued during 1959 on the $46-million expansion of Los Angeles International Airport, including steel work on the 13-story control tower, runway extensions, and building site preparations. Work will begin this year on additional terminal buildings. Scheduled for completion early in 1961, the airport is designed to accommodate 23-million passengers annually.

• **Los Angeles Harbor**—The City of Los Angeles will spend about $50 million over the next five years in a continuing program of expansion. Major individual contracts include a $4-million supertanker terminal completed in July 1959, a $4-million cargo terminal now nearing completion, and dredging for a $15-million passenger-cargo terminal scheduled to be ready for use in 1962. Total of contracts under way in 1959 was about $25 million.

• **Orinda-Walnut Creek Freeway**—Nearing completion are two major portions of the Orinda-Walnut Creek Freeway, total cost $13.1 million. One project comprises 2.1 miles of 6-lane freeway, while the other is 4.2 miles of 4-lane freeway built as a by-pass around the town of Walnut Creek.

• **Marina del Rey Harbor**—Scheduled for completion early next year is this $30-million small craft harbor and recreation area for Los Angeles County. Approximately 50% completed, the development is designed to accommodate 9,000 fishing and pleasure boats.

• **U. S. Highway 40**—Five new sections of U. S. 40 between Sacramento and the Nevada state line were brought to full freeway status during 1959; total length of these projects is 58 miles. Of the 120 miles of U. S. 40 between these two points, 85 miles are freeways. Of the remaining 35 miles of the old two-lane route, 13 miles are under construction and 10 more are budgeted. Remaining length is scheduled for future improvement. Total cost of bringing the entire 120 miles to freeway status is estimated at $104 million.



FLUSH LIGHTS are built into new runway at New York International Airport.

• **Sacramento Deep Water Channel**—Construction continues on this $46-million project, which will permit ocean-going vessels to move inland 90 miles from San Francisco to Sacramento. The ship channel will be 30 ft deep and from 200 to 300 ft wide from Suisun Bay to Lake Washington near Sacramento. Goal is to bring the first ocean-going vessel to Sacramento by July 1962. In progress are dredging, canal, lock and bridge contracts totaling about $17 million.

• **Mission Bay**—Scheduled for completion this year is a $4.5-million dredging contract involving removal of some 16 million cu yd of sand at Mission Bay Aquatic Park at San Diego. Total cost of eventual development at Mission Bay is expected to be $30 million.

• **Southern California Freeways**—Freeway development in the three-county area of Los Angeles, Orange and Ventura continued apace in 1959. Major developments in the country's most concentrated and extensive system of freeways include these:

Of the total 70.3 miles from Los Angeles to the Kern County line on the **"Golden State Freeway,"** all but 2.4 miles has been completed, is under construction, or has been financed. During 1959, a 1.6-mile section was completed at a cost of $4,240,000. Four other contracts were under way during last year: a 3.1-mile section to be completed next month at a cost of $7,626,500; a 1.2-mile project to be finished at the same time at a cost of $3,040,000; a 4.1-mile, $8,324,000 section scheduled for completion in May 1961; and a 2-mile link costing $3,478,000, also to be completed in May 1961. To be advertised soon is a 4.5-mile project, including interchanges with the Pasadena and Glendale Freeways, estimated to cost $19.5 million. Included in the 1960-'61 budget is $14 million for a 6.4-mile section.

At the end of 1959, 17 miles of the 90-mile **"San Diego Freeway"** were complete. When finished, this route will extend from the Golden State Freeway in LA to the town of San Clemente. Projects completed in 1959 included a 3.6-mile section costing $6,190,000 and an 8-mile, $4.1-million stretch. Under construction and scheduled for completion in 1960 are two sections, totaling about 10 miles in length and costing about $11.5 million. Construction items included in the 1959-'60 and 1960-'61 budgets but not yet advertised total more than $45 million.

On the 75.6 **"Ventura Freeway"** 16.8 miles of full freeway and 32.7 miles of expressway had been completed by the end of 1959. Currently under contract are two sections, totaling 8.1 miles at a cost of nearly $14.0 million. Scheduled for advertisement during 1960 are nearly 10 miles of freeway, estimated to cost about $20 million.

None of the 17.2 miles of the **"Santa Monica Freeway"** has been opened to traffic, although a $3.4-million bridge over the Los Angeles River was completed late in 1959, as were four bridges at the Harbor Freeway interchange. Construction will begin shortly on 4 miles of viaduct freeway, at a total cost of $24.7 million. One contract is in progress on a 4.7-mile section of the **"Harbor Freeway,"** for $8 million.

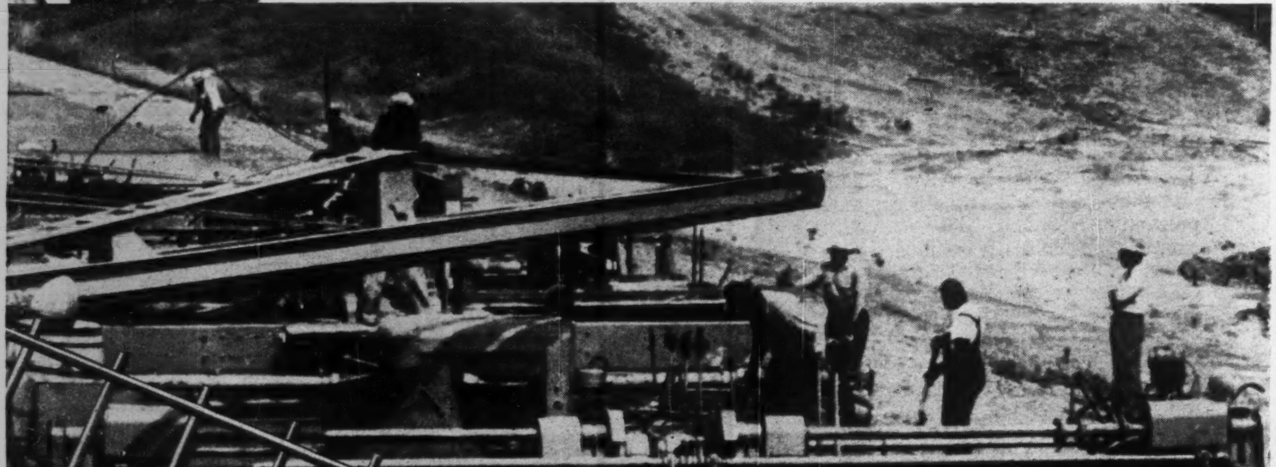
• **Port of Long Beach**—Due for completion in 1960 at the Port of Long Beach are construction projects totaling about $11.2 million, including a new administration building. Projects completed in 1959 included the $8.1-million R. R. Shoemaker Bridge. Scheduled for starts this year are $15.8 million of major projects, including $4.4 million for Pico Avenue Service Road and Railroad.

• **Hawaiian Expressways** — Four major expressway projects have been completed or are now under construction in Hawaii. Completed last year was the final 6.7-mile link in the 41-mile, $17-million Hamakua Coast Highway to Hilo, Hawaii. Scheduled for completion this year is the $12.5-million Kaliki Valley Highway, including two 2,700-ft vehicular tunnels. Work continues on the 7.7-mile Lunalilo Freeway across Honolulu, eventual cost of which is estimated at $54 million. To be completed next year is the 8.1-mile, $21-million Nuuanu Valley Highway and its tunnels.

CF&I Steel Products and the Construction

For years, CF&I has been a prime supplier of steel and steel products for the construction industry. Continual research, one of the meanings behind our Corporate Image, has resulted in new and improved steel products for construction use.

CF&I has also earned a reputation among construction men for product dependability... swift,

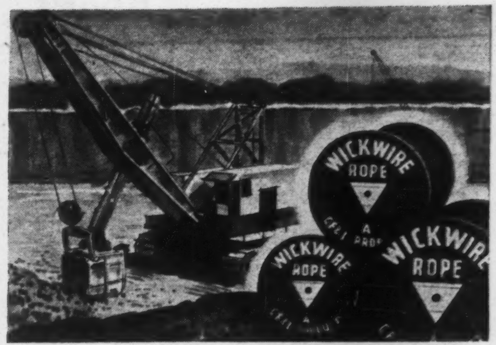


WELDED WIRE FABRIC: CF&I-Clinton Welded Wire Fabric gives concrete extra strength and resistance to cracking, and spreads load stresses over a wide surface. Available in all standard gages and furnished in rolls or mats for quick installation.

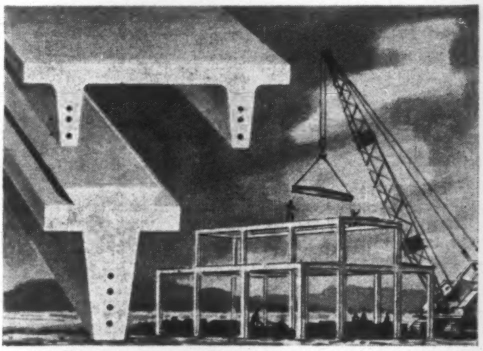
Industry

reliable delivery through distributors and warehouses... and in-field service to our customers.

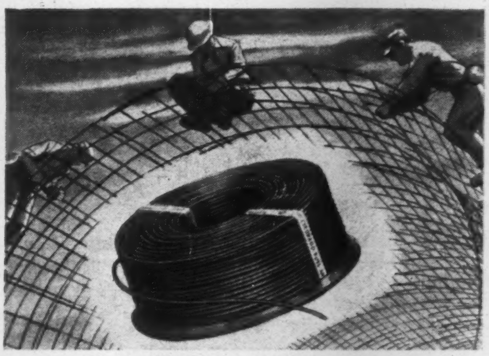
Always it is the aim of CF&I to help America's progress with the American-made steel products shown on these pages, along with a complete line of other steel items for the Construction Industry.



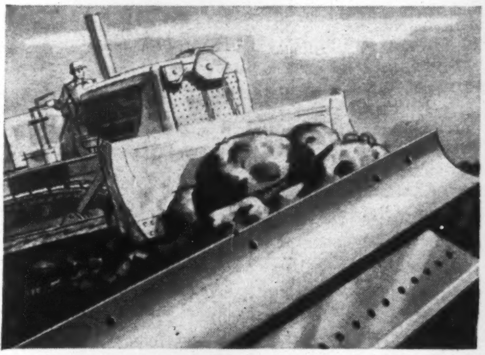
WIRE ROPE: CF&I-Wickwire Wire Rope is made in a broad range of grades and constructions, each designed to resist the punishment inflicted by different operations—abrasion, bending, crushing, or a combination of these wear factors. A complete line of Wire Rope Slings is also available.



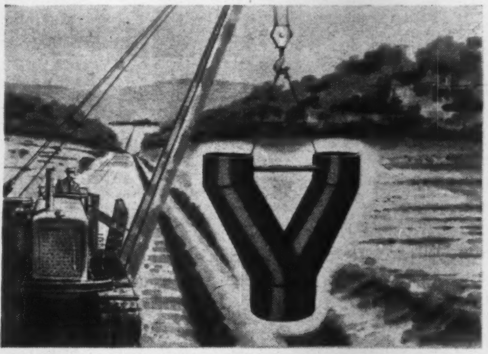
PRESTRESSED CONCRETE STRAND: Stress relieved after stranding, CF&I 7-wire Strand is flexible and easy to use. It is made to ASTM Specification A-416 and is ideal for pretensioning applications. CF&I also offers quick delivery on Prestressed Concrete Wire made to ASTM Specification A-421.



TIE WIRE: CF&I Cal-Tie Wire can't kink, tangle, snag or scratch, assuring maximum safety and economy in tying steel. That's because it is furnished for use in a handy belt dispenser that protects against hazards of loose coil ends. The wire comes in 16 gage. Reinforcing Bars are available in sizes No. 2 to No. 11.



GRADER BLADES: Scientifically designed, CF&I Blades and other Cutting Edges are carefully made of special analysis steel to eliminate hard or soft spots. This assures extra-long service. Wide selection of lengths, widths, thicknesses and hole spacings, flat or curved, beveled or squared edges.



STEEL PLATE PRODUCTS: CF&I's Claymont Plant fabricates many types of structural steel plate products—including weldments for underground water viaducts, base and bearing plates for bridges, expansion joints for penstocks, side seal plates for guide gates on dams, and many others.

For complete information on all products, ask for Catalog G-104, "CF&I Steel Products for the Construction Industry."

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Books

History of the Skyscraper

Offices in the Sky—Earle Shultz and Walter Simmons. 328 pages. Bobbs-Merrill Co., Indianapolis, Ind. $6.

Here is a well written, well researched history of the skyscraper from the early approaches to skeleton framing in Chicago to the latest office buildings in New York City. It not only traces developments in architecture and structural engineering, heating and plumbing as they occurred from about 1879 on, but also advances in building management.

The authors credit the start toward modern skyscrapers to the Chicago fire of 1871 and the subsequent reconstruction. Skeleton framing was developed during the rebuilding of the city.

The role of the elevator is not overlooked. Without it, tall buildings would be impractical. The authors recall the dramatic demonstration of safety brakes in 1853 by Elisha Graves Otis that gave impetus to the use of passenger elevators in buildings.

From the birth of skeleton framing in Chicago, the authors move on to its adoption in New York City and the rise of the skyscraper. Throughout, they tell one anecdote after another about the personalities involved that make this history come alive. After all, these events didn't just happen; they resulted from an interplay of human forces and environment.

Italy's Architecture

Italian Villas And Palaces by Georgina Masson, 244 pages. Harry N. Abrams, New York. $17.50.

This book takes us back to a time when beauty was the prime measure of good architecture. Through a series of 200 photogravure plates, the author depicts the various styles of Italy's palaces and villas, and their architectural evolution from the time of the Renaissance to the early 19th century. Included are detailed descriptions of the facades; the characteristic open arcades; and the compact Florentine structures which were centrally planned round an open courtyard.

Making Engineer Soldiers

U. S. Army in World War II—The Corps of Engineers: Troops and Equipment—by Blanche D. Coll, Jean E. Keith and Herbert H. Rosenthal. 622 pages. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. $4.00.

The period from about the time in 1939 when the Germans made blitzkreig a household word until U. S. Army Engineer units began going overseas in large numbers was a hectic one for the Corps of Engineers. It had to train officers and troops, organize new types of units, and develop and procure specialized equipment. And it also had to find its place and function in a new type of army.

This book relates how it was done and who did it. As such it should interest anyone who had a part in the great build-up that put more than a half-million Engineer officers and enlisted men in the armed forces by the end of the war.

Just Published . . .

Le Boulonnage des Roches en Souterrain—A 180-page book on French practice in rock bolting in tunnel work by Andre Hugon and Andre Costes. Editions Eyrolles, 61 Blvd., Saint Germain, Paris 5, France. 3,035 francs.

Determination of the Quality of Oily Substances on Beaches and in Nearshore Waters (Part 1)—Sanitary Engineering Research Laboratory University of Southern California, Characterization of Coastal Oil Pollution by submarine Seeps (Part 2)—Robert A. Taft, Sanitary Engineering Center U. S. Public Health Service. 61 pages. State Printing Division, Documents Section, Sacramento 14, Calif. $1.50.

Natural Fluoride Content of Communal Water Supplies in the United States—Public Health Service, No. 655, U. S. Government Printing Office, Washington 25, D. C.

Water Resources Paper No. 115—Department of Northern Affairs and National Resources, Ottawa 4, Ontario. $3.00.

Engineering Aspects of Glacial Soils of Newark, N. J.—Rutgers Bureau of Engineering Research, New Brunswick, N. J. $1.50.

Hydro-Electric Progress in Canada, 1958—Department of Northern Affairs and National Resources, Ottawa 4, Ontario. Free.

Price List of AEC Research Reports—No. 31 from OTS, U. S. Department of Commerce, Washington 25, D. C. Free.

Index of Topographic Mapping in California—California Department of Water Resources. State Printing Office, Sacramento, Cal. $2.00.

Water Power Resources of Canada—Department of Northern Affairs and National Resources, Ottawa 4, Canada. Free.

Protection From Moisture for Slab Construction On and Below Grade—Publication 707. Building Research Advisory Board, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, Washington 25, D.C. $1.50

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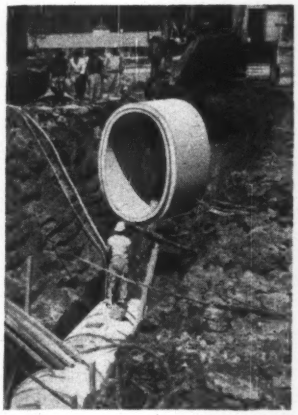

2. HI-HED PIPE is inherently stronger than its round pipe equivalent for use under extremely high fill. Makes full use of available cross-room without disturbing existing facilities.

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A-M's elliptical concrete pipe was chosen for this combination sewer project because of its increased self-cleansing velocities at periods of dry-weather flow—and used in three ways on this single job . . . as Lo-Hed, Hi-Hed and Inner Circles Pipe. The two mile line, engineered by Consoer Townsend & Associates, Chicago, runs from the Teletype Corporation in Niles, Illinois, to the north branch of the Chicago River.

American-Marietta's reinforced elliptical, as well as round, pipe is available in a full range of sizes with pretested strengths to meet various specifications—can be delivered in quantity when and where needed from any of A-M's many plants located from coast to coast.

Our technical staff will be pleased to assist you with your pipe problems

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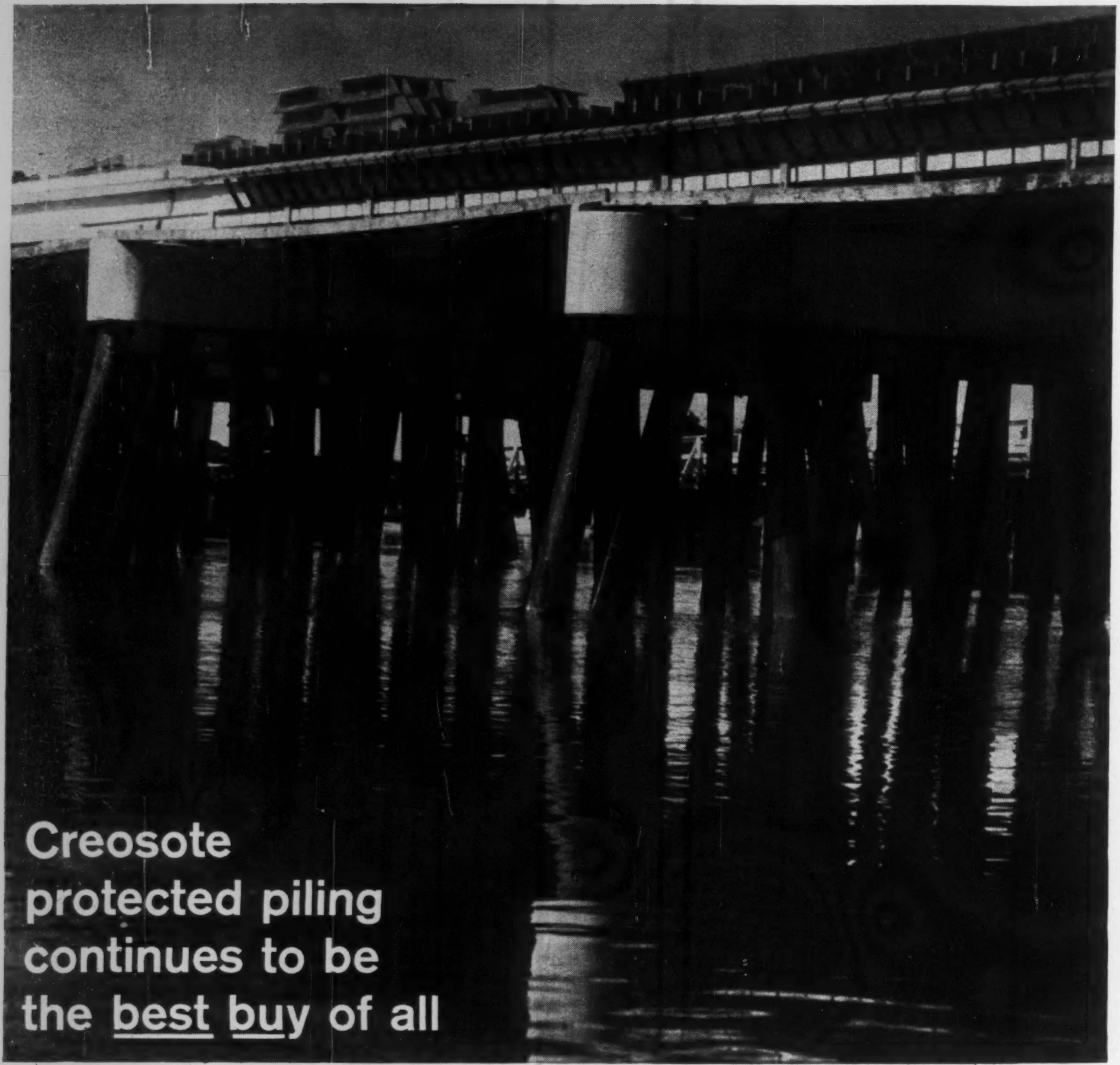
Creosote protected piling continues to be the best buy of all

Nowadays with all the modern materials for bridge building, engineers are relying on the tried and tested support material—pressure creosoted piling—for bridges and similar structures. For example, the engineers of the modern Manahawkin Bay bridges in New Jersey specified pressure creosoted piling because of its dependable long-lived service.

Right now, with construction costs ever rising, road and bridge builders are doubly conscious of the long-run performance. Pressure creosoted timbers have remained strong and serviceable for 40 years and more! Whether it be bridges, culverts, poles or other road structures that require long-life protection, specify pressure creosoted lumber because of its:

MULTIPLE TOXICITY: Marine borers, fungi and wood destroying insects cannot develop immunity to the many toxic agents in creosote.

PENETRATION EASILY CHECKED: You can see the depth of penetration in any cross section.

THE ONLY TIME-PROVED PRESERVATIVE: Pressure creosoted wood has remained strong, without costly maintenance for generations.

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Legal

Contractor Held to Bid Error

If a contractor submits a bid and signs a contract based upon a unilateral mistake arising from his negligence, he can be held to his contract.

In a recent federal case, the mistake involved kitchen equipment for a veterans hospital to be built at Topeka, Kan. Peter Kiewit Sons, Co., was one of several firms bidding for the general construction contract. Heifetz Metal Crafts, Inc., bid $99,500 for the kitchen-equipment subcontract – $52,000 less than any bid Kiewit received.

Upon questioning by Kiewit, Heifetz confirmed the bid and its conformity to plans and specifications. Heifetz also said it was submitting the same bid to other general contractors bidding on the hospital.

Since Kiewit had already submitted its own bid, it telephoned the awarding agency on the day of bid opening to reduce the bid by $52,000. This last-minute reduction won the general contract for Kiewit.

When Kiewit requested rough-in drawings of the kitchen work, Heifetz asked for complete plans and specs and several weeks time to prepare the drawings. Kiewit complied, but urged Heifetz to send drawings for Building 20 immediately and forward drawings for the other buildings later.

When Heifetz received the plans, it realized the project involved more than Building 20, on which it had based the estimate. Though Building 20 contained the principal kitchen equipment for the hospital, several other buildings also required kitchen equipment.

Kiewit had no responsibility for Heifetz' error in assuming work was to be done only in Building 20. Heifetz originally obtained plans only for Building 20 from another general contractor who asked for a bid on the kitchen-equipment work. Everyone working on Heifetz' bid had overlooked the specifications that called for kitchen equipment in more than one building.

Heifetz sued to rescind its contract, whereupon Kiewit counterclaimed for $50,100–the extra amount paid to another subcontractor for the kitchen-equipment work. The trial court dismissed Heifetz' suit and granted Kiewit's counterclaim. This ruling was upheld on appeal.[1]

The appellate court held that the mistake resulted from Heifetz, negligence and the contract could not be rescinded without harm to Kiewit. It stated: "Generally, it may be said that equitable relief by way of rescission will be given from a unilateral mistake relating to a material feature of the contract of such grave consequence that enforcement of the contract would be unconscionable, if the party making the mistake was in the exercise of ordinary diligence, and relief can be given without serious prejudice as to the other party, aside from loss of his bargain." **(1) Heifetz Metal Crafts, Inc. v. Peter Kiewit Sons' Co., 264 F. 2d 435, U. S. Court of Appeals, March 5, 1959.**

Parol Evidence

Court admits such evidence to determine intent

Oral evidence is admissible to resolve ambiguities in contracts and other construction documents as to the intent of the contracting parties.

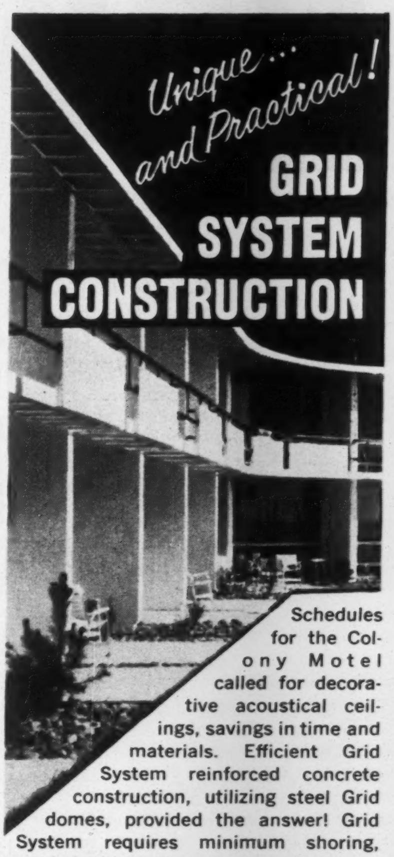
Such ambiguities arose from a contract between Rea Construction Co., a prime paving contractor at Pensacola, Fla., Naval Air Base, and B. B. McCormick & Sons, Inc., drainage subcontractor. McCormick was to install a drainage system and backfill all paved areas to the top of the subgrade, where the drainage was installed.

Rea contended this agreement included backfill of the area formerly occupied by the pavement that was removed to dig the trend. McCormick refused to perform this work. He sued Rea and its surety for the contract price plus interest. The trial court awarded McCormick's claim. The appellate court upheld the decision, but ruled out any interest prior to the judgment.[1]

During appeal, Rea objected to the admission of evidence of negotiations, understandings and actions of the parties that showed the disputed work was not covered by the subcontract.

Overruling this objection, the appellate court stated: "While the use of parol evidence is not permitted to create ambiguities . . . so that such uncertainties may thereafter be eradicated by more of the same kind of evidence, the process of interpreting a series of written documents as complex as the intricate assortment of plans, drawings and specifications covering a major industrial construction project is not merely the simple task of picking out and then applying words

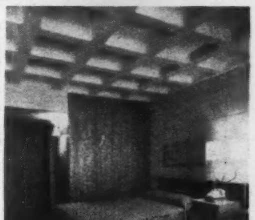
(*Legal continued p. 160*)



Schedules for the Colony Motel called for decorative acoustical ceilings, savings in time and materials. Efficient Grid System reinforced concrete construction, utilizing steel Grid domes, provided the answer! Grid System requires minimum shoring, speeds building time, saves material and labor costs over solid slab construction — and Grid's coffered ceiling effect provides neat, modern appearance at minimum cost.

Colony Motel, Swampscott, Massachusetts. Architect: Salsberg & LeBlanc. Construction: Poley-Abrams Corp.

Interior of the Colony illustrates Grid's modular appearance. Economical Grid System ceilings are just painted — no finishing or acoustical treatment is required.



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NOW haul two loads ...with LW

Here's the best way ever developed to cut earthmoving costs: LW TANDEMS. *You can now pull and operate TWO scrapers behind any electric-control 'Pull* prime-mover.* You get 100% more capacity at only about 30% more cost!

The tandem concept is not new: experiments toward this earthmoving ideal have been underway for decades. Only now, however, *and only from LW,* has a practical tandem, in a practical size-range, been available.

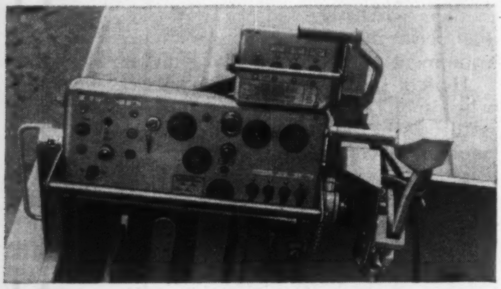
LeTOURNEAU-WESTINGHOUSE

"C" Tandem loads 36 yd in 40 to 55 seconds

At Pinole, California, Contractor Al Periera used this 270-hp C Tournapull® with tandem C Fullpak® scrapers to move 36 *yards per cycle.* In pre-ripped clay, with a 191-hp pusher, C Tandem needed only 40 to 55 seconds to load both bowls heaping full. Tandem kept pace with single scraper on same job, climbed 18% grades, used only 13 more gallons of fuel per shift.

Electric control solves problem of operating second scraper

Main reason ONLY LW offers tandem scrapers is LW electric control. These buttons operate bowl-lifts, aprons, and tailgates . . . top row for rear scraper, bottom row for front. Moving a button closes circuit, sends power from engine mounted generator, along wires to desired control motor. Unlike mechanical or hydraulic power, electricity arrives instantaneously, with no loss of power, and with no extra power source needed.



LW Distributors everywhere can now convert your present 'Pulls to tandem operation, or equip you with new 1960 'Pulls already prepared for tandem use. See your LW Distributor soon, for full details!

every trip TANDEMS

Making the breakthrough possible is exclusive LW electric control. This system sends working-power any distance via simple wire, thus solving the problem of operating a second scraper as efficiently as the first. And LW has developed a universal-swivel hitch that permits complete maneuverability and handling ease of the tandem.

YOU SAVE THREE WAYS:

1 — Original investment:

You double your capacity, but pay only for a second scraper and incidental hitch and installation. You save the price of the second prime-mover!

2 — Operating costs:

One operator handles both scrapers. Your only "extra" operating cost is for a few more gallons of fuel per shift!

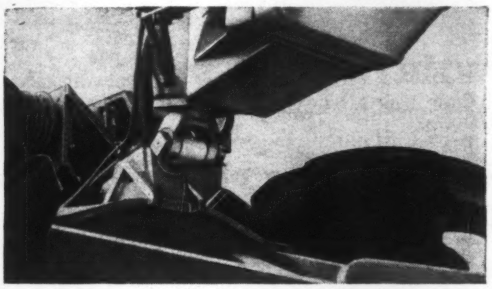
3 — Maintenance:

Upkeep is *almost the same* for "singles" as for tandems! You have 2 more tires to maintain, plus nominal maintenance of the second scraper, but there is no extra engine, no extra transmission or final drive to care for!

LeTOURNEAU-WESTINGHOUSE

Big, rugged hitch permits full maneuverability

Universal swivel-hitch joining front and rear scrapers lets tandem U-turn, back-up, perform any other maneuver possible with single scrapers, with no jack-knifing. Hitch base is welded to reinforced push-block frame of front scraper. Rear scraper's electric leads "plug in" to jacks on front scraper. Hook-up is so simple that once installed, you can change from single to tandem operation, or back, in less than half an hour.



YOU ENJOY THESE ADVANTAGES:

1 — You need less pusher-power:

Only one of the tandem scrapers loads at a time, so you don't need "super" pushers or tandem-pushers. You save pusher positioning time, too.

2 — Haul roads take less abuse:

Ton-for-ton, tandems punish haul roads *less* than single scrapers of equal capacity. And there's less congestion and delay with fewer units.

3 — You get more adaptability:

You can meet changing job conditions by hitching or unhitching the "extra" scraper on short notice. And you can still interchange your basic scraper for a 'Pull Rear-Dump, whenever needed.

*Trademark TP-2256-DC-2

LW **LeTOURNEAU-WESTINGHOUSE COMPANY,** PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

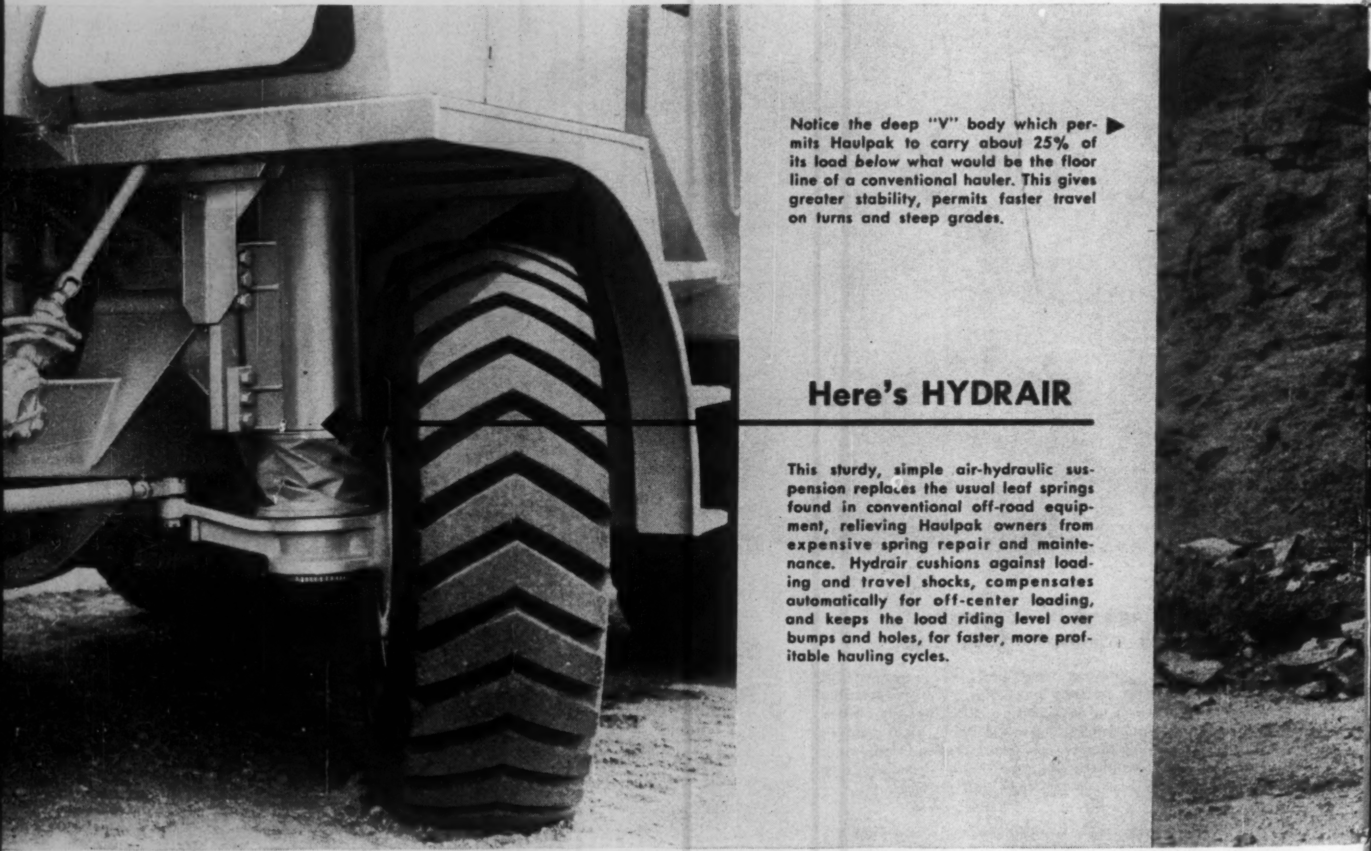
Question 1:

What's different about Haulpak®?

ANSWER: The LW Haulpak is like other off-road trucks *only* because it has wheels and an engine! Otherwise, its design is completely different... for your benefit. For instance:

RIDES ON AIR — Other trucks ride on steel springs that need much attention. Haulpak eliminates this major cause of downtime with the exclusive LW HYDRAIR* suspension system. With it, Haulpak *rides on air*... the load rides smooth and level on rough roads. You can safely use faster hauling speeds, move more tons per hour. Hydrair also makes possible many other advantages:

SHORTER TURN RADIUS — Because Hydrair suspension eliminates need for conventional springs and



Notice the deep "V" body which permits Haulpak to carry about 25% of its load *below* what would be the floor line of a conventional hauler. This gives greater stability, permits faster travel on turns and steep grades. ▶

Here's HYDRAIR

This sturdy, simple air-hydraulic suspension replaces the usual leaf springs found in conventional off-road equipment, relieving Haulpak owners from expensive spring repair and maintenance. Hydrair cushions against loading and travel shocks, compensates automatically for off-center loading, and keeps the load riding level over bumps and holes, for faster, more profitable hauling cycles.

Question 2:

How does Haulpak save you money?

ANSWER: From the answers above you can easily see how this all-new hauler *saves* on hauling costs, gives you:

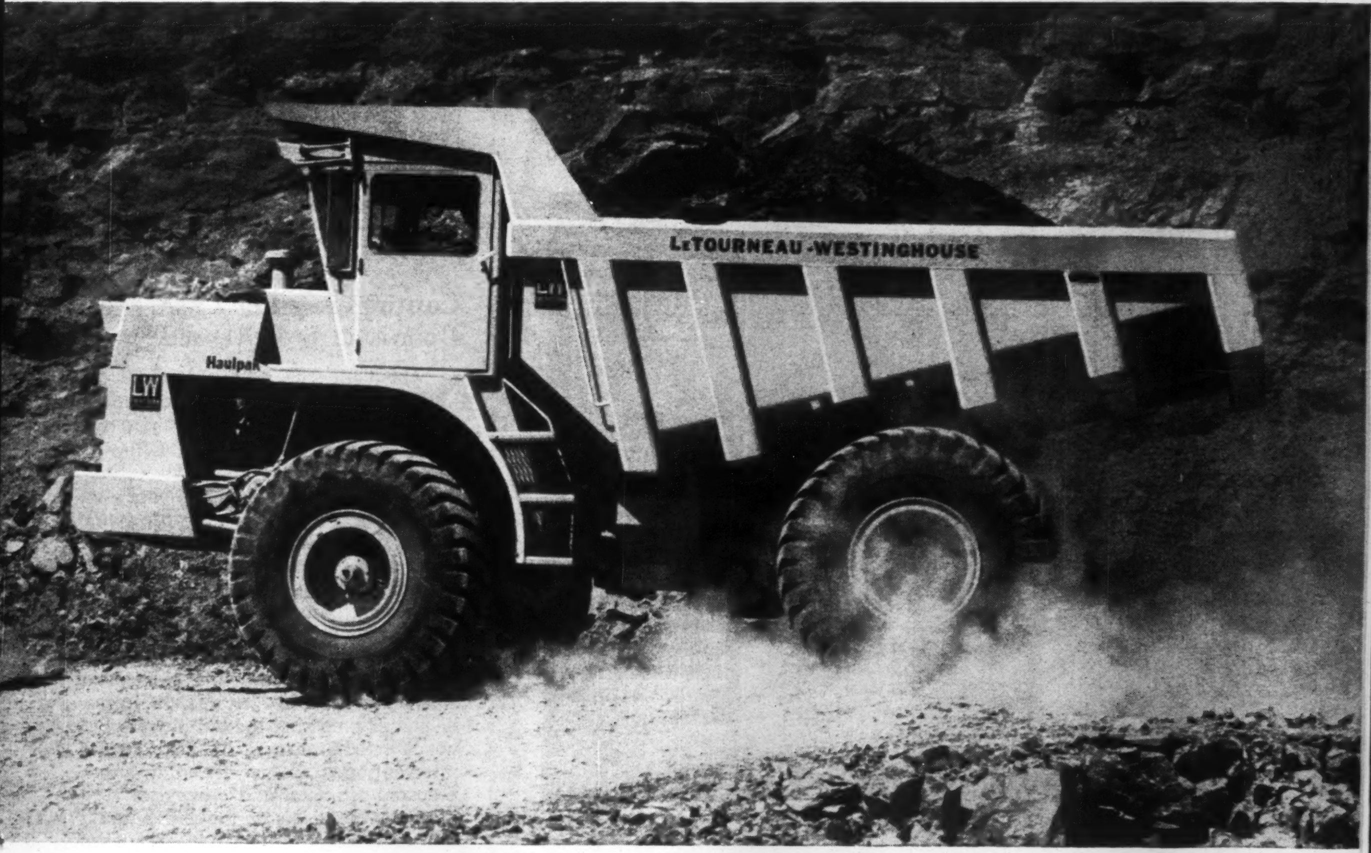
- **greater maneuverability**
- **lower operating cost**
- **lower maintenance**
- **faster hauling**
- **more pay-tons per hour**
- **...and bigger profits**

front axles, Haulpak's front wheels can be turned at sharper angles . . . permits U-turns in 2/3rds the space required by competitive trucks. And without need for springs and axles, Haulpak can be built with a shorter wheelbase for more efficient transfer of power-to-wheels. There is, however, no loss in load capacity, because you get the LW exclusive . . .

DEEP "V" BODY — This permits carrying about 6 tons of material *below* the normal floor-line of conventional trucks. It also gives you a lower center of gravity, better stability on turns and steep grades.

HAULS THROUGH DEEP MUD — Haulpak is equipped with the famous LW power-transfer differential, used for many years in thousands of heavy-duty Tournapull® earthmovers all over the world. When one drive wheel begins to slip, power is transferred automatically to the wheel on firmest footing. Soft going does not stop Haulpak!

MANY OTHER MONEY-SAVERS! You save on fuel, because Haulpak is built of the newest lightweight high-tensile strength steels . . . to reduce deadweight and increase pay-load. Also, Haulpak gives you power-shift Torqmatic transmission, full power-steering, multiple-disc brakes with 5,148 sq in. total braking surface, double-acting hydraulic rams that lift body to 70° tilt in 16 seconds for fast dump. And lubrication check is reduced to only 3 easily-reached fittings needing attention only at 500-hr intervals. Haulpak is not just a "beefed-up" highway truck . . . it is a totally new concept developed to cut off-road hauling costs.



Next time you need an off-road hauler, investigate Haulpak. Now available in 3 sizes: 22, 27, and 32 tons capacity. Request literature, and ask to see our new color movie, *"Revolution on Wheels"*.

*Trademark HP-2261-G-2

LW **LeTOURNEAU-WESTINGHOUSE COMPANY,** **PEORIA, ILLINOIS**

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

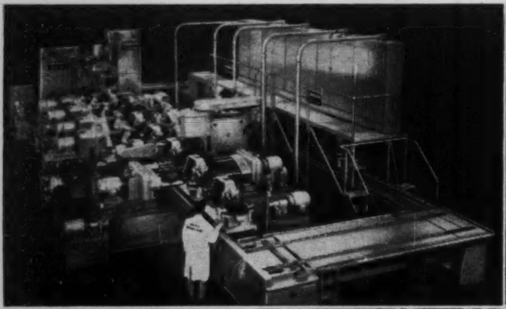
Complicated Concrete Forms Eliminated by WELD-CRETE®

-the amazing liquid bonding agent!

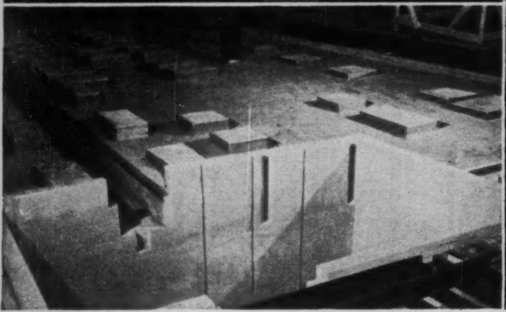
Produces substantial savings for Eaton Manufacturing Company

The Problem: To install two 75-ton 25′ x 67′ milling and drilling machines on concrete floor of Cleveland plant. Machine had to rest on piers rather than floor itself, and forms required for single pour of these mounts were extremely expensive.

Weld-Crete the Answer: Weld-Crete was brushed on 36″ thick base floor at spots where 80 piers were to be located. With the simplest of forms, these 8″ thick piers were later poured with assurance of a permanent bond to the base. The $650,000 machines have operated on these mounts for over three years.



75-ton machine mounted upon 80 concrete piers permanently bonded by Weld-Crete to concrete floor base.



Shows some of 80 piers bonded to concrete base by Weld-Crete. Simple bonding replaced complicated forming, resulted in appreciable savings in installation of 75-ton machines shown above.

Whether you're installing new equipment, moving old, or repairing floors . . . Weld-Crete enables you to *permanently* bond new concrete *directly* to old . . . or *any* sound surface. No costly, time-taking chipping, drilling, roughening, acid washing or scarifying of concrete base. When used with quick setting cement topping, you can lay new floors, ramps, driveways, etc., and run heavy truck traffic over them the next day. The insurance of a permanent bond with Weld-Crete costs as little as 4c per square foot! Get fact-packed literature about Weld-Crete from your Weld-Crete dealer, see Sweet's File, or write us direct.

The use of Weld-Crete is protected by U. S. Patent 2,760,885

LARSEN PRODUCTS CORPORATION
Box 57561 Bethesda, Md.

For Bonding Plaster to any surface . . . ask for Plaster-Weld®

literally in their normal connotation. There is a preliminary matter of understanding at least enough of the setting to have assurance that the words employed by parties in a technical undertaking are read in the light of that activity. . . . In the absence of a specific definition of some terms, notably 'trench' and 'subgrade,' we think the District Court was right in . . . the receipt of evidence of the negotiations, contemporaneous understandings and the subsequent actions of the parties which stamp their own construction on the agreement."

The parol evidence showed that, prior to the subcontract, the two parties negotiated the work to be covered.

Interest prior to the judgment was not allowed because the subcontract provided that McCormick wasn't entitled to payment until Rea was paid by the Navy. McCormick failed to prove Rea was paid before the judgment.

(1) Rea Construction Co. v. B. B. McCormick & Sons, Inc., 255 F. 2d 257, U.S. Court of Appeals, Fifth Circuit, May 13, 1958.

Contingency Fee Case Dismissal Is Reversed

Appellate court calls void only that provided for on contingency.

In the July 30, 1959, issue of ENR a case was discussed where an action by an engineer to recover for services rendered in connection with the obtaining a government contract on a contingency basis was dismissed on the ground that such a contract was void as being against public policy. This judgment was reversed on appeal, the appellate court holding that where the engineer succeeded in having the contractor placed on a list of eligible bidders on a government contract and thereafter helped in preparing the bid but the bid was rejected and thereafter without the intervention of the engineer, he again prepared estimates and other data used in the preparation of the bid but did not in any way attempt to influence the government officials to obtain the contract and as a result of competitive bidding, the contract was awarded to the contractor, only that part of the contract which provided for payment on a contingency basis was void, but the engineer was entitled to recover the fair and reasonable value of the services rendered in preparing the bid. The appellate court[1] directed a partial retrial to determine the fair value of the services rendered.

(1) Browne v. R. & R. Engineering Co., 264 F. 2d 219, U.S. Court of Appeals, Feb. 18, 1959.

Unit Prices

Rocket Engine Test Stand

Contractor must plan for safety on this hazardous job at the Edwards Air Force Base in California

Construction of rocket engine test stand IB at the Edwards Air Force Base in California, is the most hazardous job undertaken at the base, and will require extra safety planning by the contractor. The installation will be used by the Rocketdyne Division of North American Aircraft. Aerojet-General Corp., Los Angeles, is the consultant.

The Corps of Engineers, Los Angeles, awarded the contract to Del E. Webb, Los Angeles, at $4,721,786, on a bid less than 2% under the engineer's estimate and only 1.1% under the second low bid of Geo. A. Fuller Co., Los Angeles.

Contract calls for construction of a reinforced concrete structure capable of accommodating testing of missile engines up to 6,000,000 lb thrust. It is estimated that approximately 12,000 cu yd of concrete and 800 tons of reinforcing steel will go into the test stand structure. The lean concrete backfill behind the rear wall, against a rock abutment, is estimated at 2,500 cu yd; the structural steel at about 70 tons. Approximately 93,000 sq ft of formwork will be needed. Because of the unusual masses of concrete that will have to be held, extra care will be required in designing the formwork.

About 400 pours will be required. The test stand will be constructed in 22 lifts, the size of the pours being about 16x18 ft, and 10 ft deep. Adjacent pours must not be made within a 24-hour period. The base slab will be poured against the excavated rock surface to properly key the base.

The government will furnish 78 strain gages to be installed in the structure. There will be 28 cables, post-tensioned to 228,000 psi, inside the steel pipes. In addition, 24 steel pipes, without cables, will be installed for future use.

Class AA concrete must attain a compressive strength of 3,750 psi at 28 days.

Due to the urgency of the project, the 320-calendar-day schedule set for its completion must be strictly adhered to. Multiple labor shifts and night work will be necessary. If changes in or additions to the work are later decided on, they must be fitted into the time schedule, but the contractor will be compensated for his additional costs. The government will also pay for standby costs where work is actually stopped by Air Force tests on existing stands at the test site.

No heavy construction traffic will be permitted. A railroad spur is at the site, and access roads, operating and storage areas will be provided.

Prevailing wages include: carpenter, $3.60; tractor operator, $4.01; crane and power shovel operator, $4.01; electrician, $4.40; common laborer, $2.88.

The bidding on the project included:

1C	Del E. Webb Constr. Co., Los Angeles	$4,721,786
2	Geo. A. Fuller Co., Los Angeles	4,774,257
12	Fred J. Early, Jr. Co., Inc. & Gordon H. Ball, Inc. (a joint venture) San Francisco	5,650,300
EE	Corps of Engineers, Los Angeles	4,806,426

Bids: 11-5-59 Items	Unit	Quantity	Unit Prices 1C	 2
Excavation	cy	145,000	$1.00	$2.50
Borrow, impervious	cy	6,200	1.00	1.80
Random fill (reclamation dam)	cy	20,000	0.70	1.00
Test stand	ls	job	770,000	300,000
Support bldg	ls	job	380,000	131,236
Instrumentation tunnel	ls	job	120,000	285,714
Observation station #1	ls	job	5,000	5,480
#2	ls	job	5,500	7,006
Nitrogen storage facility	ls	job	745,000	718,700
Liq oxygen stor facility	ls	job	275,000	327,592
Liq oxygen pipe, 6", vacuum insulated	lf	900	145.00	174.94
Fuel storage, unloading & distribution facilities	ls	job	238,000	349,396
Channel drain	ls	job	1,500	2,425
Culverts, 24"	lf	1,200	6.50	12.00
end sections	ea	34	40.00	60.00
Drop inlet	ea	1	75.00	125.00
PCC paving, type 1	sy	4,506	4.50	6.00
Stab aggr base course	cy	2,690	6.80	7.80
Bituminous surface course	t	2,000	8.80	10.00
Tack coat	gal	25	6.00	2.00
Asph cmt for bit surf crse.	t	120	8.40	40.00
Bituminous prime coat	t	17	90.00	65.00
Pavement striping	ls	job	100.00	100.00
Conc curb & gutter	lf	1,070	2.50	2.80
Wheel bumpers	lf	200	1.10	1.50
Metal guardrail	lf	500	4.00	5.50
Cable guardrail	lf	6,300	2.30	2.50
Guideposts	ea	50	8.00	10.00
Stop signs	ea	10	30.00	40.00
Sewer system	ls	job	20,000	22,800
Stilling basin (station 5+63.95 to 6+40.45)	ls	job	4,337	6,500
Conc drainage channel lining to sta 5+63.95	cy	300	30.00	47.50
PCC paving, type 2	sy	370	6.30	10.00
Water reclamation facility	ls	job	49,000	59,454
Deflector water facility	ls	job	660,000	666,062
Deluge & domestic water facilities	ls	job	210,000	223,461
Modification of existing pumphouse #3	ls	job	21,000	25,035
Chain link fence, new	lf	2,350	4.30	4.00
Electrical distribution	ls	job	390,000	464,181
Instrumentation & control system	ls	job	396,780	450,000
Fire alarm & evacuation signal system	ls	job	7,500	12,800
Chain link gate, 10'	ea	1	150.00	125.00
Ch link fence, remov & relocate	lf	3,100	2.26	2.00
Guard rail, remov & replace	ls	job	200.00	200.00
Dismantling & demolition.	ls	job	400.00	600.00
Excavation, additional	cy	500	20.00	35.00

Completion schedule: 320 cal days
Liquidated damages: None

(*Unit Prices continued p. 162*)

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SYLGAB
STEEL and WIRE ACCESSORIES for Fast
FIREPROOFING
of Structural Steel

RIGID BEAM CLIP
5' lengths
— installed with lightning speed.
Made of #12 or #10 gauge galvanized.

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HAUNCH STIFFENER
for beams over 16" deep. Made of #10 or #12 gauge galvanized wire.

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TOGGLE HANGERS
More rigid than any wire. Used in conjunction with
SYLGAB SNAP-ON HAIRPIN CLIP
to tie main and cross furring together.

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Sylgab Steel & Wire Accessories conform to the specifications of the Concrete Reinforcing Steel Institute.

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BEAM CLIPS • SPECIAL COLUMN CLIPS
EXPANSIBLE CLIPS
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Wide Spread in Sewerage Bids

Two contracts for expansion and improvement of the Rehoboth Beach, Del., sewerage system will cost the city $335,146, which is 4.2% below the $350,000 estimated by the engineers. W. A. McWilliams is City Manager. Albright & Friel, Inc., Philadelphia, is the consultant.

The award at $299,450 to Page Construction Co., Flourtown, Pa., on the mechanical and structural work was 10% below the second bid and almost 37% below the high of 12 bids. Page's base bid was $302,650, from which $3,500 was deducted for use of alternate gas recirculation equipment for primary and secondary sludge digestion tanks, and $300 added for alternate covers for the tanks.

Contract includes replacing the present Imhoff tank at the sewage treatment works with a 26x53-ft primary settling tank with straight line collectors. Two 25-ft-dia digesters, a vacuum filter 6 ft in dia x 2 ft 8 in., and a 10x16-ft chlorine tank will be added.

Work at three existing pump stations will include installation of new pumps. In the primary sludge digestion tank, a gas recirculation system will provide a high rate of sludge digestion.

On the electrical work, the award went to Miller Electric Co., Salisbury, Md., on a base bid of $35,320, to which $376 was added for alternate gas recirculation equipment for the sludge digestion tanks.

Concrete must attain a minimum compressive strength of 3,750 psi average for five test cylinders.

Cast iron pipe, class 150, must conform to ASA standards A21.6 or A21.8; class 22 thickness to ASA A21.6.

The contractor must furnish all the materials. Truck and rail transportation is accessible to the site. The railroad is one mile from the project.

The bidding on the two contracts included:

Structural & Mechanical Work

1C	Page Constr. Co., Flourtown, Pa.	$299,450*
2	Carl E. Widell & Son, Merchantville, N. J.	335,455**
12	United Engr. & Maint. Co., Norristown, Pa.	472,945

* Base bid less $3,200 for alt. sludge tank equp.
** Base bid less $2300 for alt. sludge tank equip.

Bds: 10-23-59 Items	Unit	Quantity	Unit Prices 1C	 2
Struct wk, sew treat plt	ls	job	$132,175	$158,000
Piles, round wood,				
15′ untreated	ea	105	2.20	4.00
25′ treated	ea	28	3.30	3.50
Mech wk for sew treat works	ls	job	132,180	128,000
Struct & mech work at pump				
sta., Silver Lake	ls	job	9,200	12,000
Lake Gerar	ls	job	2,050	5,000
Main	ls	job	9,125	13,000
CIP 6″ water main, cmt lined				
w Tyton jts, avg depth 3′	lf	1,900	5.50	5.50
ftgs, cmt lined, mech jt	lb	1,500	0.35	0.50
Gate vlvs w vlv box	ea	7	$80.00	$125.00
Fire hydrant w 1 4½" steamer nozzle & 2 2½" hose nozzles	ea	1	170.00	240.00
1 2½" hose nozzle & 1 2½" outs hose nozzle vlv	ea	2	170.00	270.00
Conc thrust blocks	cy	5	20.00	30.00
Alt. equipt for sludge digester tanks:				
add for alt floating cvrs	ls	job	300.00	.....
deduct for alt. gas recirculation equipment.	ls	job	3,500	2,300

Electrical Work

1C	Miller Elec. Co., Salisbury, Md.	$35,696*
2	J. R. Walker, Chalfont, Pa.	42,483

* Base bid plus $376 for alt gas recirc equip for sludge digestion tanks

Bids: 10-23-59 Items	Unit	Quantity	Unit Prices 1 C	 2
Electrical work at				
sewage treatment works.	ls	job	$16,500	$20,800
Silver Lake pump sta	ls	job	5,530	6,827
Gerar pump sta	ls	job	5,150	6,494
Main pump sta	ls	job	8,140	8,362
Add for alt. gas recirc equip for sludge digest tanks	ls	job	376.00	.....

Completion schedule: 365 cal days
Lquidated damages: $50/day

Low Bid on Jet Fuel Line Takes Air Base Award

On a low bid of $9.64 per lin ft (6% below the next bid) for 5,981 ft of jet fuel transfer line, Frank J. Knight, Centerline, Mich., won this $73,294 Detroit Corps of Engineers' award for work at the Selfridge Air Force Base, Mt. Clemens, Mich. The total was 4.5% over the engineer's estimate, 3% under the second bid and almost 27% below the high bid.

Contract is for construction of a line to transfer jet fuel from bulk storage tanks to operating storage. The line will be jacked under two taxiways, 75 ft and 120 ft wide, respectively, necessitating cathodic protection. A total of 6,300 lin ft of 8-in.-dia, coated and wrapped black steel pipe, with welded joints, will be required for the transfer line and crossings. Contract includes all necessary related and appurtenant work.

The contractor must furnish all materials. The railroad is at the site.

The seven bids on the project included:

1C	Frank J. Knight Co., Centerline, Mich.	$73,294
2	Eames & Brown, Inc., Pontiac, Mich.	75,478
7	Maintenance Engrs, Inc., Flint, Mich.	99,773
EE	Corps of Engineers, Detroit	70,121

Bids: 11-19-59 Items	Unit	Quantity	Unit Prices 1C	 2
Jet fuel transfer line	lf	5,981	$9.64	$10.75
xing, N-S taxiway	lf	85	29.80	31.50
compass swinging base access road	lf	30	24.16	15.75
East taxiway	lf	130	31.65	22.05
Joy Blvd.	lf	44	35.94	15.75
bituminous road	lf	30	15.93	13.65
Cathodic protection	ls	job	6,250	4,064

Commence: 4-24-60. Complete: 8-31-60.
Liquidated damages: $30/cal day

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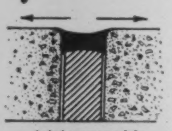
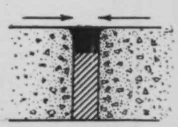

Joints opened in sub-zero temperatures


Joints compressed in warm weather temperatures

Hot-Poured Para-Plastic is an effective joint sealer consisting of a rubberized asphalt compound that forms a tough, resilient, adhesive, and waterproof seal, which will maintain bond at sub-zero temperatures. Para-Plastic is unaffected by temperature extremes and insures a moisture-tight seal of expansion, contraction and dummy joints in concrete pavement of all types. Millions of pounds of Para-Plastic have been installed on Air Force, Navy and civilian air fields, State Highways and similar projects.

COLD APPLIED

ZERO-LASTIC®

Here is a cold-applied ready-mixed rubberized asphalt sealing compound designed for sealing horizontal expansion, contraction and dummy joints to prevent infiltration of moisture and foreign material in concrete pavement of highways, airports and other concrete construction. Widely used for new construction as well as maintenance. For relatively small jobs Zero-Lastic can be economically applied with a caulking gun.

BONDTITE

A highly effective, two-component, cold applied Joint Sealing Compound specifically developed for use on Airport pavements open to Jet Traffic. Bondtite is extremely resistant to chemicals, solvents and jet fuels, and provides excellent adhesive and bonding properties to both new and old concrete. Bondtite is not affected by extreme temperature variation and the pavement can usually be opened to traffic one hour after application, depending upon temperature.

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Materials Prices

Monthly Market Quotations by ENR Field Reporters

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over, 3x12x12 In.	4x12x12 In.	8x12x12 In.	STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over, 8x12x12 In.	10x12x12 In.	12x12x12 In.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, in paper, Carload lot, Hydrated finishing	Common hydrated	Pulverized
Atlanta	$186.10pe	$154.95pkke	$309.90pe	$348.65pe	......	......	$33.20uu	$36.70uu	$36.50hh	$28.50hh	$28.50hh
Baltimore	217.00	231.00	434.00	491.00	602.00	690.00	36.00	41.00	35.80	23.40	.....
Birmingham	135.00pss	152.00pss	......	303.00p	376.00p	465.00p	27.00ff	38.00jj	38.28mm	20.87mm	26.33gmm
Boston	232.00†mm	248.00†mm	463.25†mm	556.00†mm	......	......	43.50p	58.00p	42.00§	34.00§	.....
Chicago	137.00ll	149.00ll	280.00ll	......	......	......	32.00	34.00	38.00ll	35.20o ii	.....
Cincinnati	160.00mmjvv	172.00jmmvv	327.00jddmm	390.00jmmvv	425.00jmmvv	500.00jmmvv	48.00jk	47.00jk	29.10jmm	25.10jmm	29.10jmm
Cleveland	200.00tt	213.00tt	......	453.00tt	......	693.00tt	41.75tt	45.75ggtt	32.75ptt	28.00ptt	.....
Dallas	155.00	155.00	306.00	370.50	452.25	560.00	30.00	50.00	41.80	24.58	28.50
Denver.....mm	170.00	185.00	310.00	310.00	390.00	442.00	30.00	54.00	48.00p	42.00p	46.00p
Detroit	242.00mm	258.00mm	483.00mm	548.00mm	723.00mm	827.00mm	51.50pmm	52.00pmm	38.00mm	30.00mm	40.00mm
Kansas City.mm	158.00	158.00	312.00	312.00	400.00	500.00	34.00	34.00	36.26	34.26	29.76
Los Angeles	r	r	r	r	r	r	38.00uu	.....	38.00nnll	38.00nnll	39.00nnll
Minneapolis	208.00pe	225.00pe	452.00pe	225.00pwe	......	......	49.00vpe	57.50ype	49.00bbe	38.00bbe	52.00bbde
Montreal	168.78auqoo	180.93auqoo	325.00ausqoo	220.00qoo	400.00qoo	......	48.25bii	56.30bii	39.00	22.00	13.25
New Orleans	198.00	198.00	370.00	370.00	......	......	42.00	55.00	44.00	32 00	32.00
New York	177.00h	189.00h	283.00ch	285.00hn	......	......	46.00p	.....	40.00p	38.00p	.....
Philadelphia	202.10ss	215.60ss	404.20ssxx	485.10ss	......	......	42.00mm	50.00mm	30 00xxmm	21.50	21.50
Pittsburgh...pp	200 00t	213.00t	400.00t	453.00t	607.00t	693.00t	39.00t	46.00t	38.00t	33.00t	34.00t
St. Louis	180.00mmpp	190.00pp	385.00pp	401.00ppp	459.00pp	621.50pp	44.00mmpp	45.50pp	1.00aapp	.80aapp	1.35 saapp
San Francisco	156.85*mm	177.10*mm	235.30dd*mm	159.40qqmm	......	......	43.00*mm	43.00*mm	29.24mm	29.24mm	31.74mm
Seattle	235.00pt	270.00pt	490.00pt	265.00pwt	......	......	52.00t	66.00t	52.00bbt	38.00bbt	4.50mbbt
Toronto	158.00rr	173.00rr	336.00rr	263.00frr	378.00rr	......	25.00rr	63.00rr	38.00mm	34.50mm	33.50mm

•§ F.o.b. yard. •* F.o.b. plant Stockton. •† F.o.b. yard Roxbury. •a Smooth. •b $4.50 del. •c 8 x 12 x 12 in.-6 cell. •d Pulverized hot. •e less 5% disc., 10th., •f 8 x 8 x 12. •g Lumps, $26.72. •h F.o.b. trucks, job site N.Y.C. •i 60 lb sacks. •j Truck load or over. •k $1.00 discount per M, 10 days. •l Red face. •m Per bb . 180 lb. processed. •n 7¾ x 7¾ x 12. •o Mason's double hydrated pressure. •p Truck lots. •q Provincial and Municipal tax extra (6%). •r Not used: earthquake danger. •s 8 x 16 x 12. •t less 2% disc., cash. •u Incl. Federal tax. •v Sand lime. •w 5 x 8 x 12. •x dumped. •y Chi common. •z Pebble; 80 lb sack. •aa 50 lb sack. •bb LCL •dd 6 x 12 x 12. •ff 80% common. •gg Smooth. •hh less 25¢ disc., cash. •ii F.o.b. plant. •jj rough; smooth; $40. •kk 3½ x 11½ x 11½. •ll less 2% disc. 10th. •mm less 2%, 10 days. •nn F.o.b., L. A. •oo less 2%, 30 days. •pp add 2% sales tax. •qq 8 x 5½ x 11½. •rr 2½% disc., 10 days. •ss 5% disc., 10 days. •tt less 2% disc., 15th. •uu less 50¢/M, 10 days. •vv 4000 pcs. and over. •xx New specification, details to come

PAINT, ROOFING—F. O. B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600 lb. (Approx.) bbl. F.O.B. Plant Dry a C	WHITE LEAD Per 100 lb. in 100 lb. cases in oil	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES; Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 380 lb. bbl. per ton
Atlanta	$13.75ggJO	$24.00ggJ	$3.59	$3.86	$3.31	$2.90kk	$2.25kk	$2.85kk	$0.67kk	$65.35kk
Baltimore	17.50lpp	24.00	3.00	4.40	3.50	2.78	4.25	4.25	.48	56.75
Birmingham	26.00†J	29.00†J	3.90J	3.40J	....	3.08†mm	3.28ii†mm X	2.28ii†mm	.75ffmm	45.00eemm
Boston	29.95†oomm	26.90†mmm	....	....	....	3.74q	2.48g	2.83g	.50g	58.00g
Chicago	15.25rJqqpp	24.00†J	....	....	....	3.80ukk	2.76okk	3.00okk	48.00bbskk	57.70†kk
Cincinnati	15.25†JO	24.00†J	....	....	....	2.87mm	2.02omm	2.42omm	.428ymm	55.96Hmm
Cleveland	25.65†	26.90†	2.580ggP	2.80zzgg	3.26qgg	2.82q	2.05o	2.42o	.484y	49.00gg
Dallas	22.50	23.50M	....	3.25B	....	3.00u	3.00o	3.00o	.470	66.00hh
Denver	23.00n	24.00	3.98	5.20	3.70	2.86	2.12o	2.80o	.50ff	50.00
Detroit	15.25r	24.00rr	2.70mm	3.95mm	2.70mm	2.82mm	2.05ommll	2.42ommll	.56ffmm	49.00mm
Kansas City	26.90lggoo	25.65	3.99	3.43	3.01	4.01mm	2.77omm	2.77omm	82y	.....
Los Angeles	16.25yy	22.00	3.30n	4.50n	4.20n	3.40nkk	2.40niikk	l	75nykk	l
Minneapolis	16.75N	21.50kk	....	....	....	2.87kk	2.12hikk	2.42hikk	.438ikk	50.00rkk
Montreal	19.45O	26.00wtt	5.52Dfft	6.55zff	5.10kfft	5.40	4.65f	4.65f	1.60	4.40uu
New Orleans	23.00Jpp	24.00J	....	....	....	2.78	1.98	2.85	.680	45.50
New York	15.25ooO	29.75	....	....	....	3.06xx	2.02xxo	2.45o	.438s	49.00*
Philadelphia	16.25Omm	24.75mm	3.35mm	3.90mm	2.65Rmm	4.70	3.60	2.85	.515	50.00
Pittsburgh	21.00mggJ	24.00J	2.20#EJ	2.25#FJ	2.25#GJ	3.57sH	2.75sH	2.95H	.48H	55.00H
St. Louis.....K	25.65†m	26.90	....	....	....	3.20iismm	2.31hhK	2.86hhK	.425yK	62.00K
San Francisco	26.70mm	26.90mm	3.20mm	4.30mm	3.50mm	2.95mm	1.97aaiimm	3.10mm	.46jj	54.00
Seattle	13.35HO	24.00H	....	4.19ccffJ	....	3.64qccH	3.16hccH	....	.55cc	.....
Toronto	14.45	20.65	5.15J	6.18J	5.95J	2.52	2.40aae	2.40o	1.01j	50.00A

•† Delivered. • Note: Red lead in oil 50% higher than white lead in oil. •* Aver. wt. approx. 425 to 550 lb drums. •a Red lead prices change frequently due to pig lead price changes. •b U.S. War Dept. Spec. 3-49A. •c ASTM Spec. D266-31. •d 80% minimum ferric oxide. •e Per 108 sf roll. •f Per 432 sq ft. •g F.o.b. yard Roxbury. •h Per roll, 65 lb. •i Net carload prices, Minneapolis and vicinity. •j 45 gal containers. •k Over 80% ferric oxide. •l Not used. •m 100 lb. keg. •n F.o.b. city. •o Per 60 lb roll. •p 6-drum, 50 gal each. •q Per 90-lb roll. •r F.o.b. factory, Chicago. •s Truckload. •t Incl. Federal tax. •u Per 90-lb square. •v Per ton. •x Ready-mixed. •y 55-gal container. •z Drums. •aa 15 lb. •bb Roofers coating and cement. •cc LCL, truck delivery. •ee Asphalt pitch in 100 lb package •ff 5-gal drums. •gg F.o.b. factory. •hh Incl. freight. •ii Per 324 sf roll. •jj Asbestos roof coating. •kk less 2% disc., 10th. •mm less 2% disc., 10 days. •oo 100 lb bbls. •pp 50 or 100 lb bags. •qq 500 lbs or more •rr F.o.b. plant, Detroit. •ss 50 lb bbls. •tt 25 lb kegs. •uu 250 lb bbls. •xx Sept.: Rolls revised to $2.75, Asph. Felt revised to 1.71. •yy Sept. revised to $12.00. • zz Sept. revised to $2.80. •A 400 lb barrels. •B ASTM Spec. D962-49. •C 95%. •D Std. black. •# Milt. spec.: E TTP27; F TTY81; G TTP31. •H less 2% disc., cash. •I Per 100 lb. •J less 1% disc., 10 days. •K add 2% sales tax. •L CL. •M 1 ton or more. •N under 500 lbs, add $1. •O 50 lb. bag. •P Sept. revised to $2.43. •Q Sept. revised to $3.23.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER‡ Neat per ton	Gauging per ton	VERMICULITE‡ Home Insulation pellets (per bag of 4 cu ft)	Plaster aggregate (per bag of 4 cu ft)	Concrete Aggregate Untreated (per bag of 4 cu ft)	PERLITE‡ Plaster Aggregate (per bag of 4 cu ft)	Concrete Aggregate Untreated (per bag of 4 cu ft)	ALUMINUM SHEET† Flat .100" th 36"x108" & 48"x144" per lbjt	Corr roof .032" th 35"x12' per shu	STAINLESS STEEL† SHEET-TYPE 302g 20 ga 48"x96"-120" per cwthh	28 ga 36"x120" per cwtmm	COPPER WATER* TUBING-TYPE L 2000 ft lots per ft ⅜"b	½"c
Atlanta	$32.00ss	$42.00ss	$1.55sss	$1.65sss	$1.80slss	$1.65ss	$1.65ss	$0.463noo	$27.17nY	$65.68nxx	$74.43nxx	$0.1762ss	$0.2464ss
Baltimore	24 00	35.70	0.95	1.15	1.15	1.15	1.55	0.462	0.451r	63.00	71.25	0.16	0.23
Birmingham	37.00ss	43.00ss	1.55ss	1.55ss	1.60lss	1.27ss	1.27lss	0.458M	9.62K	67.34K	76.09K	0.20ss	0.27ss
Boston	24.00	30.00	1.40	1.40	1.40	1.55ss	1.50ss	0.462	29.35p	64.42dd*xx	72.67dd	0.1762ss	0.2464ss
Chicago	26.80tt	26.80tt	1.55	1.60	1.60l	1.60	1.60	0.506x	9.30a	64.15ee	72.40ee	0.1814	0.2545
Cincinnati	23.85*ss	23.85*	1.75*ss	1.75*ss	1.75*ss	1.85ss	1.90ss	0.434	9.59	65 30xx	74.05xx	0.1814ss	0.2545ss
Cleveland	28.00N	45.00N	1.14ss	1.16ssX	1.24lssX	1.45ss	1.45ss	0.484aa	8.48	63 33ooxx	71.58ooxx	0.1814tt	0.2545tt
Dallas	30.65	30.65	1.05	1.21	1.37	1.21	1.32	0.452	0.451r	64 09	72.34	0.1668	0.1986
Denver	27.00	27.00	1.50	1.40	1.50	1.50ss	1.60ss	0.475	10.89	65 32gg	73.57gg	0.1772	0.2380
Detroit	28.00ss	28.00ss	1.27ss	1.31ss	1.40ss	1.45ktt	1.50ktt	0.452a	10.19a	65 15axx*	73.90axx*	0.2058	0.2887
Kansas City	30.00	35.00	1.19E	1.21E	1.29lE	1.21	....	0.463	23.20ggyy	67.50E	76.25E	0.1814	0.2545
Los Angeles	27.00tt	28.00tt	1.25ktt	1.20ktt	1.25tt	1.11	1.11	0.515	9.77Z	65 02	73.27	0.1814	0.2545
Minneapolis	35.00F	35.00F	1.65tt	1.80F	1.95F	1.40S	1.50S	0.468	16.23	63.61GR	69.61ffG	0.1446f	0.2025
Montreal	27.60h	35.60h	1.25h	1.40h	1.50h	1.15v	1.15v	43.95AH	12.10H	64.75H	.....	0.1840	0.2187
New Orleans	34.00	48.00	1.25P	1.35P	1.25P	1.21P	1.21P	0.526	24.90	64.00Y	85.60Y	0.1814	0.2545
New York	29.00	35.00	1.40	1.35	1.40Y	1.35	1.45	0.462aT	0.2335aX	64.08aB	72.33aB	0.1814	0.2545
Philadelphia	26.50	31.00ss	1.40ss	1.40ss	1.40lss	1.35ss	1.35qqss	0.485	9.46	63.71	71.96	0.1814	0.2545
Pittsburgh	30.00nn	33.00nn	1.50nn	1.50nn	1.50mm	1.50nn	1.50nn	0.452	9.46	64.00	76.25pp	0.1441	0.2019
St. Louis.....uu	30.00uu	41.00uu	1.50uu	1.60uu	1.65uuY	1.60uu	1.60uuY	0.452	10.28	65.39Kmm	71.89yuu	0.1814fmss	0.2545fmss
San Francisco	29.50ss	30.50ss	1.38ss	1.38ss	1.50ss	1.38oss	1.58oss	0.502	9.76	69.00K	76.75K	0.1814	0.2543
Seattle	42.40nn	45.60nn	1.55nn	1.25knn	1.85lnn	1.50k	....	0.46D	10.40D	64.02D	83.27D	0.1756	0.2460
Toronto	30.40	50.00	1.45	1.45	1.65	45.00Q	....	0.4295	26.00ap	73.74	86 52	0.3001	0.3339

‡trucklots, delivered †fob warehouse *fob city •a delivered •b ½" O.D. •c ⅝" O.D. •d per sf •e 34" x 60" sheet •f per 100 ft •g 5 tons & up: cold roll, anneal & pickled 2B finish •h incl. Federal tax •i add 25¢ for pint of additive •j 1100 & 3003 alloy, mill finish •k bag of 3 cu ft •l treated with air entraining agent •m 2-10M ft •n fob mill fr equalized with nearest stocking competitor •o 250 sacks or more •p 100 sq ft •r per lb •s 30 lb bag •t 36" x 108";-10.81 lb/sh; 48" x 144"; 21.7 lb/sh •u 19.31 lb/sh •v fob plant •w 48" x 144" •x 0.11"th •y 27 gauge •aa 16M lb & up •dd add $1.00 cwt boxing •ee 4 tons & up •gg add $2/cwt boxing; $0.75/cwt on skids •hh Theoretical wt for 48" x 96"; 60.4-lb, per sh •ii 300-bag lots •jj 100-lb bag •mm Theoretical wt; 19.7-lb per sh •nn 2% cash •oo skid packed •pp type 304 •qq Philadelphia and suburbs. •rr less 2% disc. 15 days. •ss less 2% disc. 10 days. •tt less 2% disc. 10th. •uu add 2% sales tax. •vv Type N. •ww Per 100 sf. •xx less ½% disc. 10 days. •yy .021 ga. •zz .061" th. •A Per 100 lb. •B crated. •C 15M lb. •D less ½ % for cash. •E Quantity differential. •F less 5% disc. 10th. •G less ½% disc. 10th. •H Fed. tax exempt. •K less ½%, 10 days. •L 5% disc. 30 days. •M 3003: .452 for 1100. •N less 2%, 15th mo. •O less $2, cash & carry. •P less 2%, 15 days. •Q per ton. •S add .10/bag under 200 bags. •T 5000# quantity on 4000# skids. •U 30 Msf quantity; $0.245 in 10 Msf quantity •X per sq ft. •Y Per sheet. •Z 6,000 lb or over.

Labor and Materials Prices Monthly Market Quotations by ENR Field Reporters

HOURLY WAGE RATES—Base rate + fringe benefits

	Common Labor									Truck drivers		
	Building	Heavy Const	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Electrical Workers	Steamfitters	1½ T	under 4 cy	over 4 cy
Atlanta	$1.90	$1.90	$3.90	$3.25	$3.45+7½¢	$3.60	$3.39	$3.50+10¢	$3.80+20¢	$1.90	$2.00	$2.25*B*
Baltimore	2.20+7½¢	2.20+7½¢	4.10+10¢	3.30+7½¢*f*	3.90+7½¢	3.35/4.05+10¢*A*	3.80+10½¢	3.75+7½¢	3.74+9½¢	2.15+7½¢	2.15+7½¢	2.25+7½¢
Birmingham	1.85	1.95	3.95	3.15	3.50+10¢*mn*	3.18	3.27	3.65	3.58+12½¢*p*	1.90	2.10	2.35
Boston	2.65+10¢	2.55+10¢	3.80+20¢	3.55+10¢	4.02+20¢	3.90+10¢	3.65+45¢	3.90+25¢	3.75+25¢	2.70+8¢	2.70+8¢	2.70+8¢
Chicago	3.02½+7½¢	3.02½+7½¢	4.07½+7½¢	3.75+20¢*o*	4.15+16¢*n*	3.75+5¢	3.95+23¢	4.10	3.95+24¢	2.55+75¢	....	....
Cincinnati	2.75	2.65	3.90+10¢	3.72*D*	3.80+10¢	3.475/3.70*A*	3.725+.04	3.97+39½	3.95+9½¢	2.55+62½¢	2.65+6¼¢	2.75+6¼¢
Cleveland	3.25*b*	3.165*b*	3.965+10¢*b*	3.99*b*	3.89+10¢*b*	3.99*b*	3.99*a*	4.05*b*	3.79+20¢*b*	2.82+15¢*a*	2.82+15¢*a*	2.82+15¢*a*
Dallas	1.80	1.80	4.00	3.35*b*	3.425+7½¢	3.45*B*	3.75+13¢	3.50+7½¢	3.575+8½¢	1.80/2.625	1.80/2.625	1.80/2.625
Denver	2.25	2.25	3.90	3.50	3.41+7½¢	3.15	3.625+12¢	3.75+14¢	3.80+10¢	2.40*B*	2.65*B*	2.80*B*
Detroit	2.80+42¢	2.80+42¢	3.90+30¢	3.55+42¢	3.90+22½¢	3.55+36¢	3.66+34¢	3.90+47	3.835+17½¢	2.95	2.95	2.95
Kansas City	2.455	2.505	3.95	3.50	3.55	3.445	3.75	3.75+355¢	3.80+9½¢	2.43	2.43	2.505
Los Angeles	2.88+10¢	2.88+10¢	4.00+25¢	3.60+20¢	4.07½+23½¢	3.61+15¢	4.125+42½¢	4.40+44	4.10+52¢	3.15½+10¢	3.15½+10¢	3.345+10¢
Minneapolis	2.70	2.70	3.875	3.45	3.62	3.45	3.50+33¢	3.55+39¢	3.62+20¢	2.70	2.70*d*	2.85
New Orleans	1.85*e*	1.85*e*	3.675+7½¢*d*	3.20*d*	3.50+7½¢*d*	3.325+7½¢*d*	3.19+5¢*jk*	3.77+7½¢	3.60+17½¢*dl*	3.32+7½¢*d*	3.32+7½¢*d*	3.32+7½¢*d*
New York	3.30+26¢*c*	3.30+26¢*c*	4.80+44¢	4.40+35¢*k*	4.60+47¢*j*	4.65+37¢	4.50+62¢	3.90+1.272	4.50+54¢	2.35+22½¢	3.40+28½¢	3.40+28½¢
Philadelphia*R**	2.50	2.40+10¢	4.10+17¢	3.785	4.30+23¢	3.935/4.215+10¢*A*	4.15+15¢	4.37½+16¢	4.10+31½¢	2.45+15	2.45+15½¢	2.45+15
Pittsburgh	2.575+20¢	2.425+20¢	4.30+20¢	3.775+20¢	4.15+20¢	3.73+20¢	3.95+20¢	4.60+34½¢	4.00+20¢	2.50+20¢	2.635+20¢	2.735+20¢
St. Louis	2.775+10¢	2.775+10¢	4.05+32½¢	3.725+10¢*c*	3.75+7½¢	3.825	3.90+07½¢	4.11+31¢	4.07½+22½¢	2.80+12½¢	2.80+12½¢	2.80+12½¢
San Francisco	2.865+10¢	2.865+10¢	4.25+42½¢	3.55+30½¢	4.075+22½¢	3.405+10¢	3.79+63¢	4.22+29¢	4.14+59¢	2.81+20¢	2.75+20	2.89+20¢
Seattle	3.15+10¢	3.15+10¢	4.15+10¢	3.38+20¢	3.59+10¢	3.59+20¢	3.72+30¢	3.80+26¢	3.81+24¢	3.15+20¢	3.15+20¢	3.35+20¢
Montreal	1.65+4¢*q*	1.65+4¢*q*	2.45+5¢*q*	2.25+5¢*q*	2.45+5¢	2.35+5¢	2.50+5¢	2.35+5¢	2.47+5¢*s*	1.65+4¢	1.65+4¢	1.65+4¢
Toronto	1.85+7¢	1.85+7¢	3.00+12¢	2.80+12¢	2.90+12¢	3.05+12¢	3.00+20¢	3.30+13¢	3.20+13¢	1.90+14½¢	1.90+14½¢	1.90+14½¢

	Tractor Operators Incl. bulldozers			Tractor scraper	Power cranes & shovels		Motor grader oper	Air comp oper	Air tool oper
	34-49 hp	70-100 hp	100 & over	15-16 cy	½ cy	¾ cy			
Atlanta	$3.00	$3.075	$3.075	$2.925	$3.45	$3.60	$2.925	$2.85	$2.00
Baltimore	3.65+10¢	3.65+10¢	3.65+10¢	3.65+10¢	4.05+10¢	4.05+10¢	3.65+10¢	3.25+10¢	2.25+7½¢
Birmingham	3.18	3.18	3.18	3.18	3.18	3.18	3.18	2.77	2.05
Boston	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.52½+20¢	3.90+20¢	3.90+20¢	3.52½+20¢	3.45+20¢	2.80+10¢
Chicago	3.50+5¢	3.65+5¢	3.30+5¢	3.30+5¢	4.10+5¢	4.10+5¢	3.50+5¢	3.40+5¢	3.70+5¢
Cincinnati	3.475+10¢	3.475+10¢	3.475+10¢	3.475+10¢	3.475+10¢	3.70+10¢	3.70+10¢	3.70+10¢	3.70+10¢
Cleveland	3.74*b*	3.74*b*	3.74*b*	3.74*b*	3.99*b*	3.99*b*	3.74*b*	3.615*b*	3.615*b*
Dallas	1.80/2.625	1.80/2.625	1.80/2.625	1.80/2.625	3.175*h*	3.175*h*	1.80/2.625	1.95	1.95
Denver	2.40	3.00	3.00	3.00	3.15	3.15	3.00	3.00	2.53
Detroit	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.55+36¢	3.275+15¢	2.93+34¢
Kansas City	2.75	3.20	3.20	3.20	3.445	3.445	3.20	3.20	2.55
Los Angeles	3.91+15¢	3.91+15¢	3.91+15¢	4.01+15¢	4.01+15¢	4.01+15¢	4.01+15¢	3.13+15¢	3.09+10¢
Minneapolis	3.08	3.30	....	3.30	3.52	3.78	3.08	2.97	2.85
New Orleans	3.325+7½¢*d*	3.325+7½¢*d*	3.325+7½¢*d*	3.325+7½¢*d*	3.325+7½¢*d*	3.325+7½¢*d*	3.325+7½¢*d*	2.675+7½¢*d*	1.95*e*
New York	4.025+32¢	4.025+32¢	4.025+32¢	4.15+33¢	4.90+39¢	4.90+39¢*k*	4.15+33¢	4.15+33¢	4.15+21¢
Philadelphia	3.52+10	3.665+10	3.665+10	3.79+10	4.215+10	4.215+10	3.765+10	3.41+10	2.35
Pittsburgh	3.565+15¢	3.565+15¢	3.565+15¢	3.565+15¢	3.765+15¢	3.765+15¢	3.765+15¢	3.275+15¢	2.435+20¢
St. Louis	3.825	3.825	3.825	3.825	3.825	3.825	3.825	3.275	3.275
San Francisco	3.70+20¢	3.70+20¢	3.70+20¢	3.70+20¢	3.85+20¢	3.85+20¢	3.75+20¢	3.10+20¢	2.955+20¢
Seattle	3.56+20¢	3.56+20¢	3.56+20¢	3.56+20¢	3.93+20¢	3.93+20¢	3.65+20¢	3.29+20¢	3.20+10¢
Montreal *q*	1.85+4¢	2.08+5¢	2.08+5¢	2.08+5¢	2.35+5¢	2.35+5¢	2.08+5¢	1.95+4¢	1.95+4¢
Toronto	2.30+10¢	2.40+10¢	2.40+10¢	2.40+10¢	2.90+12¢	3.05+12¢	2.70+11¢	2.40+10¢	2.40+10¢

ENR Skilled Average (Bricklayers, Carpenters, Iron Workers): $3.95, ENR Common Average $2.635

Description of fringe benefits last appeared Feb. 26; will next appear in Sept. 17 Cost Issue. •A 1-2 drum.

DEFERRED WAGE INCREASES UNDER PRESENT CONTRACTS: 1960: a **May 1; 10¢** b **May 1; 12¢** k **May 1; 8¢** l **May 1; 10¢** m **Jan. 1; 15¢** n **Jul. 1; 5¢** o **Jun. 30; 22½¢** s **Apr. 1; 15¢ 1959:** c **Dec. 1; 10¢** d **Nov. 1; 10¢** e **Nov. 1; 5¢.**

BUILDING BOARD & LATH AND INSULATION—DELIVERED TRUCKLOAD LOTS

	GYPSUM PLASTER BOARD tapered edge per Msq ft		GYPSUM BOARD LATH plain or perf per Msq ft	GYPSUM SHEATHING tongue & groove per Msq ft	FIBER BOARD SHEATHING asph impreg & coat per Msq ft		FIBER BOARD INSULATION sq edge, paint per Msq ft	MINERAL WOOL INSULATION		GLASS FIBER INSULATION		ALUMINUM FOIL	
	½"	⅜"	⅜" x 16" x 48"	½" x 2' x 8'	½" sq ed	25/32" T&G	½"	loose, per 40-lb bag a	3" batts per M sf	loose, per 40-lb bag a	3" batts per M sf	60# Kraft 1 side foil per roll of 250 s. f.	Expansible Blanket 2 layers foil per Msq ft
Atlanta	$65.00*F*	$55.00*F*	$42.50*F*	$68.00*F*	$72.00*F*	$127.00*F*	$75.00*F*	1.59*z*	$70.00*F*	$2.00	$80.00*F*	$4.77*qi*	
Baltimore	54.00	47.50	35.75	55.70	65.00	108.50	69.00	1.40*F*	67.50*F*	1.60*F*	47.00*F*	4.00*F*	$33.50*F*
Birmingham	68.90*H*	57.00*H*	47.77*H*	75.00*H*	67.50*H*	140.50*H*	83.50*H*	1.40	70.00	1.60	75.00	3.77*gG*	......
Boston	60.00*mH*	50.00*mH*	36.00*mH*	60.00*mH*	65.00*H*	120.00*H*	79.00*hnH*	1.40*bH*	75.00*H*	......	75.00*H*	5.30*xHS*	53.50*qH*
Chicago	67.00	54.00	45.00	62.00	87.00	123.00	87.00	1.85	80.00	......	63/65*l*	5.25*j*	......
Cincinnati	52.50*wH*	42.85*wH*	33.05*wH*	51.16*wH*	77.00*wH*	125.00*wH*	72.50*wH*	1.45*wH*	62.50*wH*	1.45*wH*	62.50*wH*	3.28*jwJ*	50.00*wJ*
Cleveland	62.00*CF*	56.50*CF*	41.50*CF*	65.00*CF*	80.00*CF*	129.00*CF*	80.00*CF*	1.35/1.50*H*	72.00*H*	......	63.75	15.00*ioJ*	55.00*J*
Dallas	56.25	46.85	42.50	56.25	68.75	118.00	68.75	2.00	65.69	1.45	70.67	5.00*gAG*	45.00
Denver	66.50*H*	58.50*H*	45.00*H*	68.75*H*	84.00*H*	130.00*H*	84.00	1.50*b*	65.00*ub*	1.75*b*	65.00*a*	5.25	48.65
Detroit	66.00*K*	55.00*K*	43.00*K*	65.00*K*	62.50*DK*	103.50*DK*	62.50*DK*	1.30*b*	50.00	1.95*b*	88.00	......	......
Kansas City	72.00*H*	62.00*H*	45.00*H*	......	75.00*H*	122.00*H*	80.00*H*	1.40*H*	75.00*H*	1.80*H*	75.00*H*	3.60*d*	53.98
Los Angeles *Q*	66.00*F*	60.50*F*	0.33*xF*	64.50*F*	75.00*F*	125.00*F*	80.00*F*	76.00*BeF*	83.00*F*	1.35*s*	64.00	4.40*g*	7.45*V*
Minneapolis *F*	75.00*F*	65.00*F*	0.41*xL*	75.00*F*	95.00*F*	130.00*F*	78.00*F*	2.25*yF*	80.00*F*	2.10*F*	80.00*F*	4.25*F*	......
Montreal	58.00*M*	49.30*M*	37/41.50*M*	53.00*M*	64.75*M*	......	58.50*M*	1.50*M*	66.00*M*	1.50*M*	66.00*M*	9.00*qM*	56.00*M*
New Orleans	57.00*H*	52.00*H*	45.00*H*	60.00*H*	67.00*H*	140.00*H*	80.00*H*	2.00*L*	70.00•	......	......	......	52.12*U*
New York	65.00*H*	55.00*H*	42.50*H*	65.50*H*	78.00	124.00	78.00	1.55*b*	68.50*k*	......	......	4.38*iH*	40.00*cH*
Philadelphia *H*	52.50	46.00	36.00	52.00	70.00	105.00	70.00	1.35	50.00	1.40	50.00	5.25	83.50
Pittsburgh	74.00*K*	65.00*K*	40.00*K*	63.00*K*	63.00*K*	103.35*K*	58.10*K*	1.10*sK*	55.00*K*	1.10*sK*	55.00*K*	4.20*iqK*	38.50*K*
St. Louis	65.00*HO*	55.00*HO*	40.00*HO*	70.00*HO*	76.00*HO*	120.00*HO*	80.00*HO*	1.35*yHO*	85.00*HO*	2.09*PHO*	74.00*HO*	4.50*iqHO*	......
San Francisco	60.00*F*	49.00*F*	0.36*xF*	61.00*F*	70.00*F*	111.00*F*	69.00*F*	1.75*F*	66.50*F*	1.75*F*	66.50*F*	5.10	60.00*F*
Seattle	66.80*K*	57.65*K*	51.05*K*	65.00*K*	74.50*K*	125.00*K*	73.50*K*	1.15*tK*	58.00*K*	1.90•*pK*	51.00•*lKh*	4.25*K*	46.50*EK*
Toronto	58.00	50.00	38.00*L*	64.50	61.50*T*	......	64.00*T*	1.65	65.50	......	65.50	14.75*o*	46.00

•* F.o.b. warehouse. •a Semi thick. •b 30# bag. •c 3 layers of foil: $54.50. •d 40# kraft paper, 5 Msf, 100/500 rolls. •e 20# sq ft bag, 4" thick. •f Full trailer loads. •g 80# kraft paper backing 400 rolls or over. •h LCL. •i 40#. •j 80#. •k 2-in. •l 2". •m 8 to 10 ton quantities. •n Distributor's siding. •o Per Msf roll. •p 32# bag. •q 500 sf. •s 35# bag. •t 26# bag •u Flame proof $75. •v 5000 sf quantity. •w F.o.b. city. •x Sq. yd. •y 30# bag. •z Spun rock wool. •A 650 sf. •B ton. •C F.o.b. plant, freight allowed. •D CL. •E 10 Msf. •F less 2% disc, 10th. •G ½ of 1%, 10 days. •H 2% disc, 10 days. •J 1% disc, 10 days. •K less 2% for cash. •L 5% disc, 10th mo. •M fed. tax incl. •N 1% disc, 10 days. •O add 2% sales ax. •P 50 lb. bags, •Q add 4% sales tax. •R revised. •S 45 lb. •T less 2%, 30 days. •U lots of 2606 sq. ft. •V 250 sf roll.

MEXICO CITY WAGES & PRICES

WAGES, av per week, 8 hr day (pesos)		Sept '59	Oct. '59
Common labor,	building (peons)	87.50	87.50
	heavy const (peons)	87.50	87.50
Skilled labor,	carpenters 1 cl	175.00	175.00
	bricklayers 1 cl	210.00	210.00
	struct. ironworkers	280.00	280.00

MATERIALS PRICES, F.o.b.City (pesos)	Sep t'59	Oct. '59
Struct. steel shapes, fob Monterey		
I-beams, 3 x 3 x 4"..... per metric ton	2400.00	2400.00
Reinf. steel, corrugated rods, per ton		
⅜"-½" x 11 meters	1900.00	1900.00
¾"-1" x 11 meters	1900.00	1900.00

	Sept '59	Oct. '59
Gravel, truckload, per cu meter		
Blue gravel	25.00	30.00
Cement, std. port. (Tolteca) per metric ton	2.40	2.40
Lumber, 2"x4" 1st class pine..per M sq. ft.	2200.00	2100.00
2"x4" 2nd class pine..per M sq. ft.	1900.00	1800.00

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, MARIE MORAVSIK, ELAINE CHOMYAK, ELIZABETH WERRA, ELEANOR QUERET, Reports,
J. H. WEBBER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

▲ **Mass., East Boston**—APRON PAVING—BA 2/3—Commonwealth of Mass., Port Authority, 14 Court Square, Boston, Contr. MPA, 1,008 TWA apron paving, Logan Airport. Approx. $1,000,000. Plans deposit $30. J. E. Greiner Co., 1106 North Charles St., Baltimore, Md., engr. CD 5/20.

BUILDINGS—LB & CA

▲ **George A. Fuller Co.,** 11 Beacon St., Boston, Mass., CA Approx. **$4,000,000,** First Phase, HEALTH CENTER, Mount Auburn St., CAMBRIDGE, MASS. Harvard University & Radcliffe College, Cambridge St., Cambridge, Mass. Sert, Jaokson & Gourley, 4 Brattle St., Cambridge, Mass., archts. CD 2/6/58.

▲ **Bliven Realty Co.,** 266 W. Main St., Mystic, Conn., Owner Builds, **$1,987,470,** 153 HOUSES, "Colonel Ledyard Estates," Second Section, Colonel Ledyard Highway, LEDYARD, CONN. CD 9/10.

The Austin Co., 600 Fifth Ave., New York, N. Y., CA **$800,000,** 440x475 ft., 299,000 sq. ft. MFG. PLANT addn., NEWINGTON, CONN. Fafnir Bearing Co., Willard Ave., Newington, Conn. Awarded Jan. 12. CD 12/9.

▲ **Geryk Development,** Camp St., Plainville, Conn., Owner Builds, **$2,000,000,** 200 HOUSES, Camp St., PLAINVILLE, CONN. CD 11/16.

▲ **Anderson-Fairoaks Constr. Co.,** 227 Newfield Ave., Hartford, Conn., CA Approx. **$1,000,000.** Catholic HIGH SCHOOL, North Main St., WEST HARTFORD, CONN. Archdiocese of Hartford, Chancery Office, 140 Farmington Ave., Hartford, Conn. Bids Dec. 30. CD 12/3.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **D. C., Wash.**—BA 2/17—D. C. Govt., Dpt. Bldgs. & Grounds, 499 Pa. Ave. N.W., Incinerator No. 4, Fort Totten Dr. and Hawaii Ave. N.E. Plans deposit $50. CD 9/9/58.

▲† **Newfoundland, Argentia**—BARRACKS, etc.—BA 3/1—Area P. Wks. Office, New York, Rm. 633, Federal Office Bldg., 90 Church St., New York 7, N. Y., 1,008 enlisted men's barracks and recreation facility, U. S. Naval Station, NBy-26798, Spec. No. 26798/59. Over $1,000,000. Plans deposit $200 (Canadian). CD 9/28.

HEAVY CONSTRUCTION—LB & CA

▲ **Frederick Snare Corp.,** 233 Broadway, New York 7, N. Y., CA **$2,717,796,** deck constr. Pier 7, Brooklyn-Port Authority Piers, Contr. BP-180.001, BROOKLYN, N. Y. Port of New York Auth., Rm. 1100, 111 Eighth Ave., New York 11, N. Y. Bids Dec. 18. CD 1/6, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Public Constructors, Inc., P.O. Box 34, Blackwood, N. J., CA **$3,116,053,** extending Interstate Rte. 295, 1.7 mi. from Rte. 47 (Delsea Dr.) in Westville to Hessian Ave. in West Deptford Twp., Gloucester Co. Bids Jan. 5, awarded Jan. 13. CD 1/7, under LB.

▲ **Construction Aggregates Corp.,** 1 E. 42 St., New York 17, N. Y., CA **$5,000,000** (7 bidders), fill for Elizabeth-Port Auth. piers, Contr. EP-110.002, ELIZABETH, N. J. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Dec. 22, awarded Jan. 14. CD 12/28, under LB.

▲ **PENNSYLVANIA**—Pa. Hys. Dpt., 506 North Office Bldg., Harrisburg,

Pa.—**Marsolino Constr. Co.,** P.O. Box 192, Uniontown, Pa., CA **$3,148,023,** 17,048 ft. rein.-con., 24 ft. wide each side earth median, 14 bridges (Interstate) L.R. 798, Sec. 1, portion Washington (PA) By-Pass, Washington Co.;

Pa.—**Hempt Bros., Inc.,** R.D. 1, Camp Hill, Pa., CA **$5,728,242,** 51,309 ft. Coatesville-Downingtown By-Pass divided rein.-con. pavement, 15 bridges, Sec. 1, Rte. 30, Chester Co. Bids Dec. 18, awarded Jan. 13. CD 12/23, under LB.

BUILDINGS—LB & CA

▲ **Gerace & Castagna, Inc.,** 2110 Northern Blvd., Manhasset, N. Y., LB **$4,887,837** (11 bidders), general contract new and altered facilities for Rikers Island PENITENTIARY, Bronx Boro, NEW YORK, N. Y. Dpt. P. Wks., Rm. 2200, Municipal Bldg., New York 7, N. Y. Bids Jan. 13. CD 1/5;

Jarcho Bros., Inc., 38-18 33rd St., Long Island City, N. Y., LB **$1,344,883** (8 bidders), plumbing for Rikers Island Penitentiary (New York, N. Y.);

Dierks Heating Co., 43-32 33rd St., Long Island City, N. Y., LB **$789,070** (5 bidders), heating for Rikers Island Penitentiary (New York, N. Y.);

Plymouth Elec. Constr. Co., Inc., 60 E. 42nd St., New York 17, N. Y., LB **$799,000** (16 bidders), electrical work for Rikers Island Penitentiary (New York, N. Y.).

▲ **H. R. H. Constr. Corp.,** 579 Fifth Ave., New York 17, N. Y., CA Est. **$1,300,000,** 13 story APARTMENT, 428-36 East 69th St., NEW YORK, N. Y. New York Hospital, 525 E. 68 St., New York, N. Y. Frederick G. Frost & Assocs., 144 E. 30th St., New York 16, N. Y., archts. CD 8/18/58.

▲ **M. Melnick & Co., Inc.,** 225 Willow Ave., New York 54, N. Y., LB **$1,109,000** (7 bidders), general contract addn. to and modernization and conversion of PUBLIC SCHOOL 93, Forest Ave. and Madison St., Queens Boro, RIDGEWOOD, N. Y. Supt. Design, Constr. & Physical Plant, Bureau Constr., 4th Fl., 42-15 Crescent St., Long Island City 1, N. Y. Bids Jan. 13. CD 12/10.

▲ **Glenwall Co., Inc.,** P. O. Box 127, Rochelle Park, N. J., LB **$1,729,000,** general contract, HIGH SCHOOL, MONTCLAIR, N. J. Town, Town Hall, Montclair, N. J. Bids 1/12. CD 12/7.

▲ **Scientific Design Co.,** 100 Park Ave., New York, N. Y., CA **$1,700,000,** design and constr. PLANT EXPANSION, 26 Jefferson St., PASSAIC, N. J. The Pantasote Co., 415 Madison Ave., New York, N. Y. CD 9/16.

▲ **Belli Co.,** 2127 Hamilton Ave., Trenton, N. J., CA **$2,028,000,** general contract 2 JUNIOR HIGH SCHOOLS, one on Yardville-Hamilton Square Rd. and other on White Horse-Hamilton Square Rd., Hamilton Twp., TRENTON, N. J. Hamilton Twp. Bd. Educ., 2069 Greenwood Ave., Trenton, N. J. Bids Jan. 5, awarded Jan. 14. CD 1/8, under LB.

▲ **J. G. Kassab, Inc.,** 2 Gateway Center, Pittsburgh 22, Pa., CA halogen type electrolytic TINNING LINE, Aliquippa Works, ALIQUIPPA, PA. Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh, Pa. Total est. **$9,000,000.**

Westinghouse Electric Corp., 3 Gateway Center, Pittsburgh, Pa., CA electrical equipment, for electrolytic tinning line, (Aliquippa, Pa.).

Wean Engineering., Inc., 347 N. Park St., Warren, O., equipment, for electrolytic tinning line (Aliquippa, Pa.).

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Va., Chantilly** — TERMINAL — BA 2/23 — Federal Aviation Agency, 1771 N. Y. Ave. N.W., Wash., D. C., terminal, Dulles International Airport. $1,000,000. Eero Saarinen, Bloomfield Hills, Mich., archt. CD 5/27/58.

† **Fla., Pensacola**—FACILITY CONVERSION—BA 3/1—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. No. 13, U. S. Naval Base, Charleston, S. C., conversion existing facilities to Naval Communications Training Center, Corry Field, NBy 25465, Spec. 25465/59. $500,000-$1,000,000. CD 9/25.

BUILDINGS—BA

▲ **Ga., Atlanta**—SHOPPING CENTER—BA 2/2—Clayton Plaza, Inc., P.O. Box 6123, Atlanta, Ga., 120,000 sq. ft. shopping center, Forest Park, $1,000,000. Former contract rescinded. Michael Hack, Henry Grady Bldg., Atlanta, archt. CD 8/10, under CA.

HEAVY CONSTRUCTION—LB & CA

▲† **J. A. Jones Constr. Co.,** P.O. Box 966, Charlotte, N. C., LB **$6,279,637,** diversion tunnel, outlet works, and access road, Summersville Reservoir Proj., Gauley River, CIVENG-46-022-60-37, WEST VIRGINIA. U. S. Eng., 237 4 Ave., Huntington, W. Va. Bids Jan. 13. CD 12/28.

▲ **O. L. Sims Co.,** Box 1651, Hattiesburg, Miss., CA **$1,207,826** (3 bidders), Bayou D'Arbonne Lake Spillway, Section 23, T-20-N,R-I-E, Union Parish, LOUISIANA. State Dpt. P. Wks., Headquarters Admin. Bldg., Baton Rouge, La. Bids Jan. 11, awarded Jan. 13. CD 12/10.

BUILDINGS—LB & CA

▲ **R. L. Coleman Constr. Co.,** P.O. Box 1636, Asheville, N. C., LB **$1,484,000,** Northside HIGH SCHOOL, GREENVILLE, S. C. Greenville Co. School Dist., 520 North Pleasantburg Dr., Greenville, S. C. Bids Jan. 12. CD 12/16.

▲ **MacDonald Engineering Co.,** 22 W. Madison St., Chicago, Ill., CA Est. **$4,000,000,** cement PLANT, HARLEYVILLE (P.O. St. George), S. C. The Giant Portland Cement Co., Harleyville, S. C.

▲ **A. C. Samford, Inc.,** P.O. Box 1229, Albany, Ga., CA **$1,469,656,** 170-unit HOUSING Projects, GA 200-1 and 200-2, MILLEDGEVILLE, GA. Milledgeville Housing Auth., Milledgeville, Ga. Bids Jan. 5. CD 1/11, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲† **Michigan and Ontario**—BA 2/4—U. S. Eng., 1101 Washington Blvd., Detroit 31, dredging fighting Island Channel, Detroit River, IFB CIVENG-20-064-60-34. $3,000,000. CD 9/29.

BUILDINGS—BA

▲ **O., Cleveland**—HOUSING—BA 2/3—Cleveland Metropolitan Housing Authority, 1332 W. 28th St., 96 unit low rent housing, Garden Valley area, $1,050,000. Plans deposit $100. Anthony Ciresi, 7113 Euclid Ave., Zone 3, archt. CD 7/31/58.

▲ **Wis., Elkhorn**—HOME FOR AGED, etc.—BA 3/1—Walworth Co., constr. Home for Aged, $2,358,500. CD 8/20/58; mental hospital addn., $418,000. Plans deposit $100 each. Ebling, Plunkett & Keymar, 1220 N. Milwaukee St., Milwaukee, Zone 2, archts. CD 11/19/58.

BUILDINGS—SLC

▲ **Wis., Milwaukee**—BANK—First Wisconsin National Bank, 743 N. Water St., soon lets contract, remodeling bank, $1,500,000. E. J. Kraus, c/o owner, archt. CD 1/4.

HEAVY CONSTRUCTION—LB & CA

▲ **ILLINOIS**—Dpt. P. Wks. & Hys., Div. Hys., Centennial Bldg., Springfield, Bids opened 1/15,

Ill.—**S. J. Groves & Sons,** 1104 E. Reynolds, Springfield, Ill., LB **$1,965,113,** (4 bidders), paving 2.61 mi. FAI 70, west of Collinsville, Madison Co.;

Ill.—**R. T. Madden,** Janesville, Wis., LB **$1,074,666,** (12 bidders), concrete paving 8.49 mi. US 20 from east of Freeport, East, Stephenson Co. CD 1/5.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldg., Div. Hys., Centennial Bldgs., Springfield. Bids opened 1/15;

Ill.—**Eric Bolander Co.,** Winchester Rd., Libertyville, Ill., LB **$548,361,** (10 bidders), grade separation Ill. 63 over Ill. 20, west of Waukegan, Lake Co.;

Ill.—**Fruin-Colnan Co.,** 1706 Olive St., St. Louis, Mo., LB **$1,475,855,** (6 bidders), 3 grade separation structures E. St. Louis Expressway over St. Clair Ave., East St. Louis, St. Clair Co. CD 1/5.

BUILDINGS—LB & CA

▲ **Sam W. Emerson Co.,** 1836 Euclid Ave., Cleveland 15, O., CA Est. **$1,800,000,** METALLURGY BLDG., CLEVELAND, O. Case Institute Technology University Circle, Cleveland 6, O. Awarded Jan. 7. CD 8/27, under LB.

▲ **Knowlton Constr. Co.,** Bellefontaine, O., CA **$1,317,700,** WOMEN'S DORMITORIES Nos. 7 and 8, Miami University, OXFORD, O. Dpt. P. Wks., State Depts. Bldg., Columbus, O. Bids Dec. 23, awarded Jan. 11. CD 1/4, under LB.

▲ **Inland Constr. Co.,** 6142 Oakton St., Morton Grove, Ill., CA **$35,000,000,** general contract OAKBROOK SHOPPING CENTER, two department stores, paving,

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; Industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	**Federal Government**
▲	**Project of $1,000,000 or over.**
ENR	**Engineering News-Record**
CD	**Construction Daily**

For additional reports see Construction Daily.

Tokeneke Elementary School, Darien, Connecticut. Architects: O'Connor & Kilham, New York City. Contractor: George L. Hickey, Inc., Stamford, Connecticut.

Space provided: fourteen classrooms, two kindergarten rooms, multi-purpose Common Room, covered play area, library, administrative suite, two conference rooms, teachers' room, health room, ten toilet areas, cafeteria kitchen, storage areas, custodial facilities. *Structural framing:* glulam timber beams spaced at 7'-9" for classrooms; glulam beam-and-column bents spaced at 21'-9" for Common Room and play area; heavy timber decking left exposed for ceilings. *Exterior walls:* brick with concrete block in service area; cypress siding for playroom. *Interior walls:* plastic coated coverings in classrooms, Common Room and halls. *Heating:* hot water radiant panel system, zoned and thermostatically controlled. *Ventilation:* exhaust fans in classrooms, toilet rooms and kitchen; tempered air supply units in Common Room. *Lighting:* semi-indirect fluorescent fixtures. *Floors:* vinyl asbestos tiles on concrete slab over insulated concrete fill and moisture barrier. *Roofing:* translucent corrugated panels over playroom and covered walks; built-up tar and felt with white graveled surface over remainder. *Volume:* 300,000 cubic feet. *Area:* 28,000 square feet. *Cost:* $14.40 per square foot; per-pupil cost $760 (state average $1105).

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sewers, mains, Ill. Rtes. 55 and 83, HINSDALE, ILL. Marshall Field & Co., 111 N. State St., Chicago 2, Ill. Loebl, Schlossman & Bennett, 333 N. Michigan Ave., Chicago 1, Ill., archts. Awarded Dec. 29. CD 5/19/58.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲ **Neb., Omaha**—TERMINAL, etc.—BA 2/10—Omaha Airport Auth., terminal, car parking area, access roads and utilities, Omaha Airport, $1,940,000. Leo A. Daly, 633 Ins. Bldg., archt. CD 6/10.

▲ **Tex., Houston**—ROADS, RAILWAY TRACK, etc.—BA 2/10—Harris County Houston Ship Channel Navigation Dist., 1519 Capitol Ave., roads, railway track, water supply system, bulk materials handling plant unit, $1,200,700. Plans deposit $50. E. B. Mansfield Co., 12 W. Shaw St., Pasadena, engr. CD 8/28/58.

HEAVY CONSTRUCTION—LB & CA

▲ **Maxwell Constr. Co.**, P.O. Box 119, Baytown, Tex. CA **$1,018,089**, bulk handling plant, channel dredging, dock work, HOUSTON, TEX. Harris County, Houston Ship Channel, 1519 Capitol Ave., Houston, Tex. Bids Dec. 30. CD 1/7, under LB.

BUILDINGS—LB & CA

▲ **F. A. Nunnelly**, 207 Staffel St., San Antonio, Tex. CA **$1,319,000**, general contract 6 story MOTOR BANK UNIT, drive-in lanes, PARKING GARAGE, SAN ANTONIO, TEX. Alamo National Bank, 306 W. Commerce St., San Antonio, Tex. Bids Jan. 5. CD 12/31.

FAR WEST

HEAVY CONSTRUCTION—BA

▲† **Utah, Salt Lake City**—TRAFFIC CONTROL CENTER—BA 3/24—Federal Aviation Agency, 5651 W. Manchester Ave., Los Angeles, Calif., air route traffic control center, IFB 4-60-1041. $1,000,000. Plans deposit $50. CD 1/6.

HEAVY CONSTRUCTION—LB & CA

▲† **IDAHO**—Bureau P. Rds., Dpt. Commerce, 609½ Bannock St., Boise, Bids opened 1/13,
Goodfellows Bros. Constr. Co., Wenatchee, Wash., LB **$1,088,031**, grade and build 12 mi. Lewis-Clark Hy. and 290 ft. bridge, Idaho Co. CD 12/31.

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City, Bids opened 1/12,
Floyd S. Whiting, Box 158, Murray, Utah, LB **$1,024,755**, est. $1,900,000 (11 bidders) 4 in. plant mix bit. surf. 6.537 mi. US 50 and 6. Proj. F-028-1 (1), Utah Co. CD 12/22.

▲ **Fred J. Early, Inc.**, 259 Pine St., San Francisco, Calif., CA **$1,257,489**, sewage disposal plant, 60,500 ft. trunk and main sewer lines, 11,130 lin. ft. sewage force mains pumping plants, treatment plants, etc. north of AUBURN, CALIF. Placer County Sewer Assessment Dist. No. 1, Courthouse, Auburn, Calif. Bids Dec. 22, awarded Jan. 14. CD 12/29, under LB.

▲† **Peter Kiewit Sons Co.**, 345 Kieways Ave., Arcadia, Calif., CA **$30,157,150**, WS 107-A-2, T-5, Titan missile silos, equip. and propellant terminals, **powerhouse, entry portal, silos, blast locks, tunnels, etc.** Complex 1A, vicinity of Lincoln, Placer Co.; Complex 1B near Pennington, Sutter Co.; **Complex 1C near Chico, Butte Co., Spec. 2639, ENG-04-167-70-23,** BEALE AIR FORCE BASE, CALIF. U. S. Eng., 1209 8th St., Sacramento, Calif. Bids Jan. 12, awarded Jan. 14. CD 1/14, under LB.

▲† **Morrison-Knudsen Co., Inc.**, Hoge Bldg., Seattle, Wash., and **Patti-Macdonald Constr. Co.**, 1100 5th St., Seattle, Wash., LB **$3,760,000**, (13 bidders), runway extension, runway lighting, taxiways and aprons, Naval Air Station, GUAM. Bureau Yards & Docks, Dpt. Navy, Pacific Div., Agana, Guam. Bids Jan. 14. CD 12/18.

BUILDINGS—LB & CA

▲ **Hospital Developers of Arizona**, c/o Bert Thorud, archt., 4721 N. Central Ave., Phoenix, Ariz., Owner Builds, **$2,700,000**, 146-bed Maryvale Community HOSPITAL, 20 acres, NE corner 51 Ave. and Campbell, MARYVALE, ARIZ.

▲ **Dorsey's, Inc.**, Northern Lift Tower, Seattle 1, Wash., Day Labor, **$1,250,000**, Coach House MOTEL, swimming pool, 4700 block on 25 Ave. N.E., SEATTLE, WASH. CD 11/20.

▲ **F. P. Lathrop Constr. Co., Inc.**, 800 University Ave., Berkeley, Calif., LB **$1,126,000**, Base Bid, 1 story 46-bed Valley Memorial HOSPITAL, LIVERMORE, CALIF. Hospital Committee for Livermore-Pleasanton Area, c/o Stone, Malloy, Marraccini & Patterson, archts., 536 Mission St., San Francisco, Calif. Bids Jan. 12. CD 12/1.

▲ **William J. Moran Co.**, 1404 Franklin St., Oakland, Calif., CA **$1,500,000**, OFFICE, OAKLAND, CALIF. Central Valley National Bank, 22nd and Broadway, Oakland, Calif. Welton Becket & Assoc., 153 Maiden Lane, San Francisco, Calif., archts. CD 9/29.

CANADA

BUILDINGS—BA

▲ **Ont., Toronto**—HOSPITAL—BA 2/11—Northwestern General Hospital, Keele St., hospital. $1,000,000. Plans deposit $50. John B. Parkin Assocs., 1500 Don Mills Rd., North York, archts.-engrs. CD 4/22.

(Continued on page 171)

CATERPILLAR
CAT
DW21
42
42

CATERPILLAR REPORTS:

THE BIG STORY BEHIND THE BIGGEST EARTHMOVING JOB IN MICHIGAN...

Holloway Construction Company depends 6,000,000 cu. yd. in 16 months on

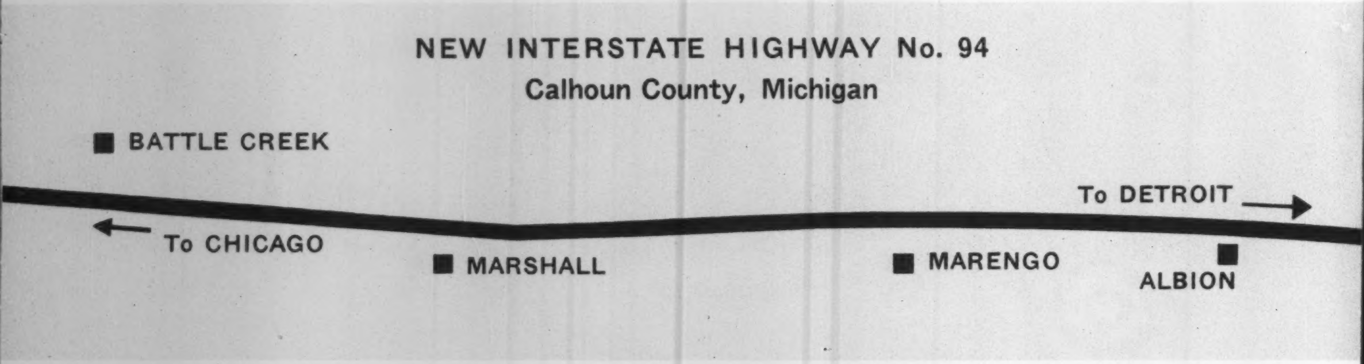
Michigan contractor's giant highway spread is 95% Caterpillar!

From Albion to Battle Creek, 6,000,000 cu. yd. of sand, clay and muck are being moved to speed traffic over the rugged hills of south central Michigan. In the largest earthmoving job ever handled by a single contractor in the state, curving U. S. 12 is being converted into 21 miles of Interstate 94.

Midway between these two cities you can stand with your feet planted deep in the soft, brown clay and look in either direction, as far as the eye can see, at the army of yellow Caterpillar machines carving out the path of this new roadway.

The Holloway Construction Co. of Livonia, Michigan, won the $8,500,000 contract by being low bidder on three continuous segments of the project. Work started on April 1, 1959, and is due for completion by August 3, 1960. As of the latest report, according to Bud Morrell, Job Supt., production was running 10 months ahead of schedule.

To keep pace with the demanding schedule, men and equipment are working a steady 11 hours every day. And the Holloway spread—twice as large as any other assembled by one contractor in the state—depends heavily on Caterpillar quality to maintain this high-production capacity.



Part of the Holloway Construction Company's massive equipment spread that is now working on Michigan's biggest earthmoving job. 95% of the machines are Caterpillar-built, assuring the dependability needed to keep the job on schedule. When work is completed, Interstate No. 94 will be one of the key routes between Detroit and Chicago.

on Caterpillar machines in moving 21-mile Interstate Highway project

There are 66 Caterpillar-built machines operating on the job including:

40 DW21 Tractor-Scrapers

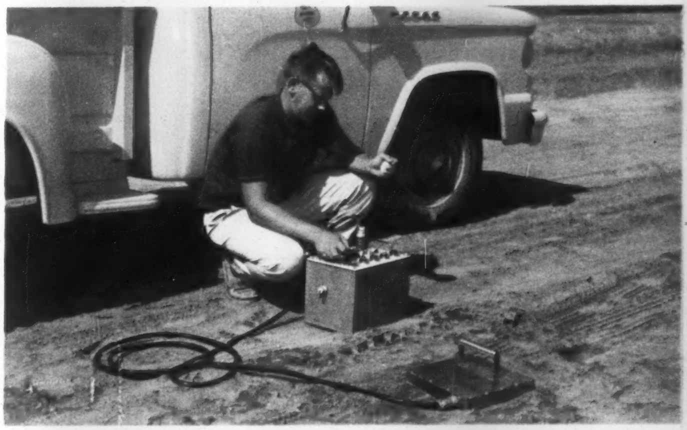
8 D9 Tractors
8 D8 Tractors
2 D6 Tractors
2 D4 Tractors
4 No. 12 Motor Graders
2 No. 14 Motor Graders

For successful contractors throughout the country like Dan Holloway, there is only one reason for using Caterpillar equipment: "I think Caterpillar is the best equipment made in terms of high production and low cost of operation."

This, indeed, is the big story behind Michigan's biggest earthmoving job.

CATERPILLAR
40

High-speed loading of DW21s with Cat D8 and D9 pushers is clearly visible in a borrow pit several miles north of Marshall, Michigan, one of the towns to be bypassed by the new highway.



Gamma Rays speed soil compaction tests. This new device, developed by the Michigan Highway Department, determines compaction as well as moisture content. In two minutes it can perform work which takes a half hour by conventional methods.

WHAT THE MEN WHO KNOW MACHINES HAVE TO SAY ABOUT CATERPILLAR-BUILT EQUIPMENT:

Francis "Bud" Morrell, Job Supt., Holloway Construction Co. "You can count on Caterpillar. When you take a big job, you must be sure that your equipment is going to stay on that job. We take care of our machines, work them like hell, and know that these Caterpillar machines take good care of us."

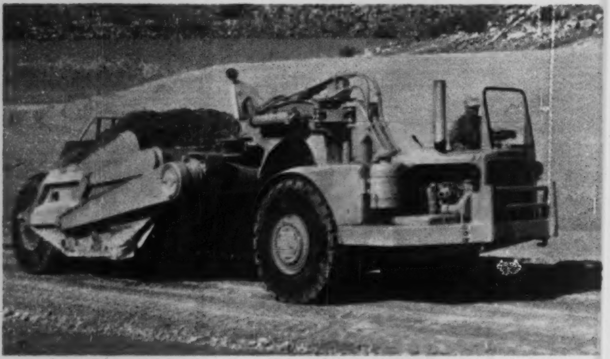
George Neely, Equipment Supt., Holloway Construction Co. "We like Caterpillar machines because they are better than any other make. We've tried them all at one time or another, but these other manufacturers have a long way to go before we change our minds on which equipment is the best."

Dan Holloway, Owner, Holloway Construction Co. "Caterpillar machines make more money for us. They stand up under 12-month-per-year punishment. Last December we moved one million yards of dirt in 28 days. We had to keep after it day after day to prevent it from freezing."

Russ Hill, Master Mechanic, Holloway Construction Co. "When a machine goes down, you have to move fast to get it back on the job. We want the right part fast. Michigan Tractor (Caterpillar Dealer) takes good care of us. When a part is guaranteed, you know they'll back it up."

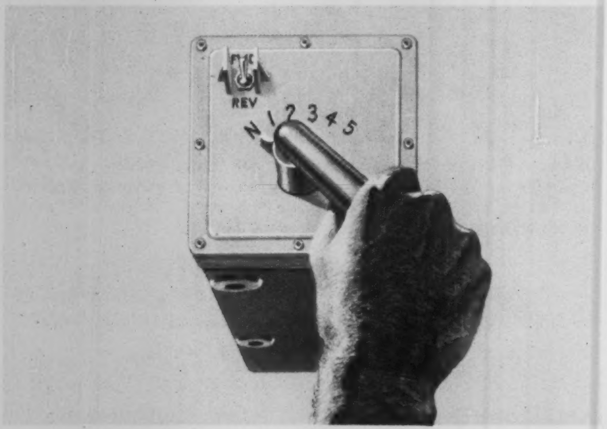
NEW PRODUCTS FROM CATERPILLAR SET NEW PRODUCTION STANDARDS

Here's a review of 3 important product developments born of Caterpillar research . . . proved in the field . . . available to you now for higher production



New 225 HP Cat No. 619 Tractor and 14 cu. yd. No. 442 Scraper

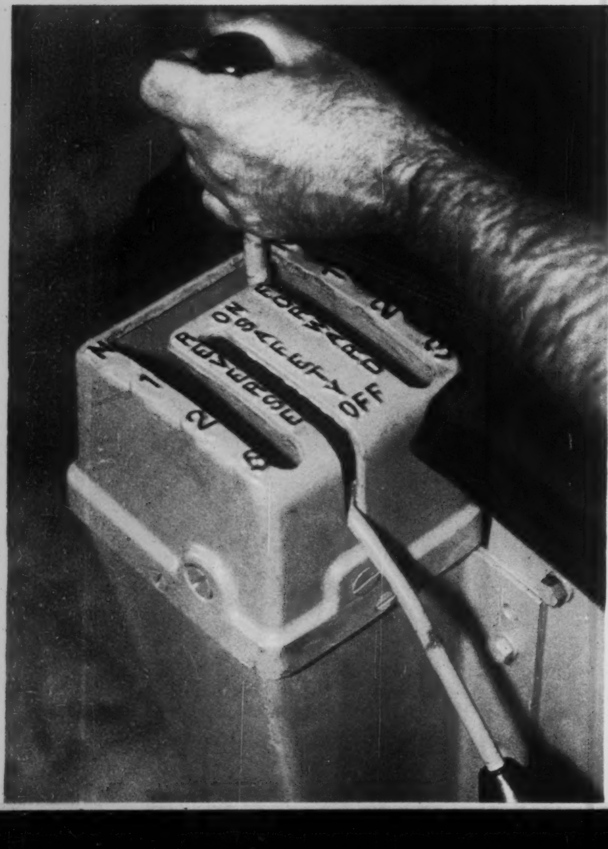
First two-wheel tractor to deliver four-wheel speed and dependability . . . matched with new No. 442 Series B LOWBOWL Scraper for new high production. The new No. 619 with Turbocharged Cat Engine provides 225 HP and high torque rise, ideal for lugging under load and fast acceleration. Its LOWBOWL Scraper handles 14 cu. yd. struck, 18 cu. yd. heaped. It has a 30.2 MPH operating speed, plus ground-hugging roadability never before found in a two-wheel tractor of comparable size. It is a versatile "all job" rig.



SynchroTouch Transmission Control
for DW20 and DW21 Tractors

An advanced new way to shift gears easier and faster. Operator simply dials desired gear for automatic, split-second, touch-and-go response! In less than a second, it is engaged. Standard foot clutch is retained but is used only starting from standstill.

Optional for DW20 and DW21 Tractors, the Caterpillar SynchroTouch Transmission Control gives you these important benefits: 1. Faster shifting—for faster cycles and more payloads per hour. 2. Significant reduction in operator fatigue. 3. Economical direct drive transmission—uses standard DW20 and DW21 transmission and clutch components. 4. No special maintenance.



Power Shift Transmission
for D8 and D9 Tractors

On-the-go shifts under full load in a split second. Changes speed, reverses direction with finger-tip control lever—and no clutching! This new transmission, with exclusive new design, provides production highs never before possible with a track-type tractor.

Power shift control is mounted to operator's left. Selector lever (black knob) eliminates gearshift, forward-reverse and flywheel clutch levers. Safety lever (red knob) prevents accidental engagement. Selector lever moves in a "U" path to various positions.

See your Caterpillar Dealer for the complete facts. Ask him to demonstrate these new product developments on your job.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

CATERPILLAR

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DIESEL ENGINES • TRACTORS • MOTOR GRADERS EARTHMOVING EQUIPMENT

GREAT NEW PRODUCTS IN THE CATERPILLAR TRADITION

(Continued from page 166)

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Emil Anderson Constr. Co. Ltd., 4482 Main St., Vancouver, B. C., CA **$2,289,022,** constr. 10.68 mi. Southern Trans-Provincial Hy. from Summit Lake to junction with Hy. No. 6 (Section 2) Nelson-Creston Dist. Bids Dec. 9, awarded Jan. 10. CD 12/17, under LB.

▲ **Dell Constr. Co. Ltd.,** 2461 Bloor St. W., Toronto, Ont., LB **$3,987,344,** (17 bidders), 300-unit housing, services, Royal Canadian Air Force Station, GREENWOOD, N. S. Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, N. S. Bids Jan. 7. CD 12/8.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto, Bids opened 1/13,

Simkin's Constr. Co. Ltd., Andrews and Jarvis Sts., Winnipeg, Man., LB **$1,069,124,** (7 bidders), grading, culverts, granular base 9.57 mi. Trans-Canada Hy. 17 from 10 mi. east of Longbow Corners easterly, (Contract 59-331), Longbow Corners.

▲ **Commercial Shearing Co. Ltd.,** Hamilton, Ont., (subsidiary of Commercial Shearing & Stamping Co., 1775 **Logan St., Youngstown O., U.S.A.), CA $2,787,250,** (12 bidders), supply, fabrication, stockpiling 5,500 structural steel ring beams required for tunnels for South Saskatchewan River Dam, Regina, SASKATCHEWAN. Prairie Farm Rehabilitation Admin., 4th fl., Motherwell Bldg., Regina, Sask. Bids Nov. 4. CD 10/22.

BUILDINGS—LB & CA

▲ **Dell Constr. Co. Ltd.,** 2461 Bloor St. W., Toronto, Ont., LB **$6,124,000,** 300 bed, rein.-con., frame, brick HOSPITAL WING, LONDON, ONT. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Jan. 13. CD 11/20.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Fla., Deerfield Beach**—City, City Hall, sanitary sewers, incl. ocean outfall disposal system, treatment plant, lines. **$3,300,000.** Black & Assocs., 700 S.E. 3 St., Gainesville, consult. engrs.

▲ **Ill., Chicago**—Bd. Comrs. Cook Co., County Bldg., Zone 2,

storm sewers, Palatine Rd., Rohlwing Rd. to Des Plaines River, Arlington Heights. **$775,000.**

storm sewers, South Rte. Expressway (West Leg), Wentworth to 103rd St. at Racine, Chicago, **$1,290,000.**

storm sewer, South Rte. Expressway, 63rd to 69th Sts., Chicago, **$650,000.**

storm sewers, ditch excav., various locations, Item 48, Chicago, **$100,000.**

storm sewers, pumping station, Northwest Expressway Tri-State Rd. to Soo Line, Park Ridge, **$530,000.** Hugo Stark, 130 N. Wells St., Zone 6, ch. engr. Bids in 1960.

▲ **Ind., Griffith**—City, City Hall, sanitary sewage treatment sys. **$2,000,000.** Consoer, Townsend & Assocs., 360 E. Grand Ave., Chicago, Ill., consult. engrs.

▲ **Neb., Omaha**—City, City Hall, **$11,500,000** bond election May 10, sewer constr. CD 1/5/59.

▲ **Wis., Milwaukee**—City, City Hall, sewer extensions for 1960. $5,000,000. E. A. Schmidt, c/o owner, city engr.

BRIDGES

▲ **Ill., Chicago**—Bd. Comrs. Cook Co., County Bldg.,

highway separation, South Rte. Expressway and 63rd St., Chicago, **$900,000.**

highway separation, South Rte. Expressway, Wentworth Ave., 64th St., Chicago, **$1,650,000.**

highway separation South Rte. Expressway (West Leg) near 97th St., Chicago, **$1,250,000.**

highway separation, South Rte. Expressway (West Leg) near 98th St., Chicago, **$400,000.**

highway separation South Rte. Expressway and State St. near 98th St., Chicago, **$1,600,000.**

highway separation, South Rte. Expressway (West Leg) at 99th St., Chicago, **$950,000.**

highway separation South Rte. Expressway, F.A.I. 90 near 99th St., Chicago, **$275,000.**

highway separation, South Rte. Expressway, ramp connection near 100th St., Chicago, **$416,000.**

two highway separations, South Rte. Expressway, over 103rd St., Chicago, **$520,000.**

railroad separation South Rte. Expressway and C.R.I. and P. R.R. North of 103rd St., Chicago, **$1,248,000.**

highway separation South Rte. Expressway and S.B. Doty Ave., near 105th St., Chicago, **$500,000.**

widen and reconstr. overpass, 73rd St. and Pulaski Rd., paving Pulaski Rd. 5.58 mi. 87th St. to 42nd Pl., Chicago, **$1,615,000.**

grade separations, 4 mi. East Lake Ave. over Lehigh Ave. and C.M. ST. P. R.R. and North Branch Chicago River Pumping Station, Glenview, **$1,100,000.**

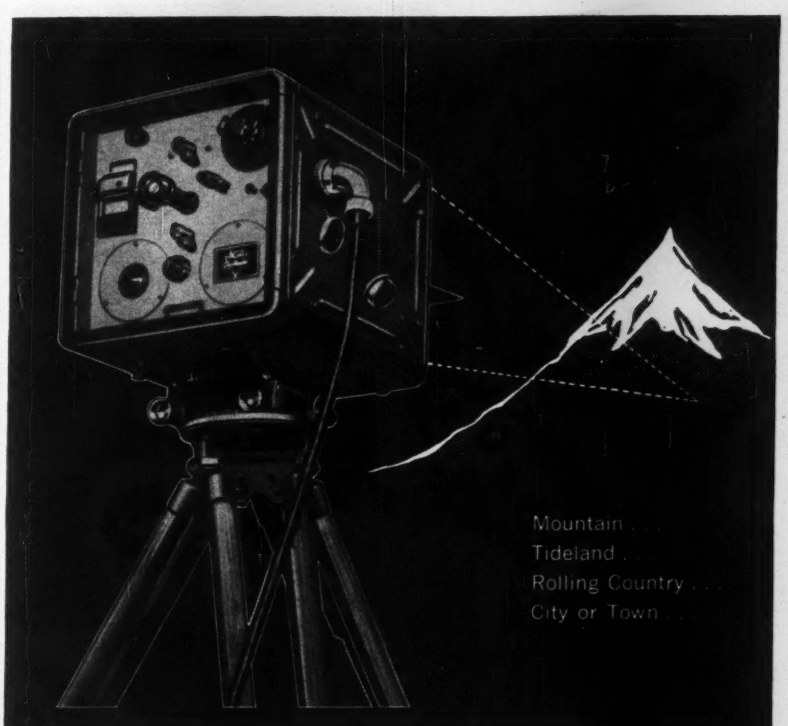
bridge and channel straightening, Torrence Ave. and Little Calumet River, Lansing, **$300,000.**

grade separation, 26th Ave., over I H B R.R., reconstr. road 1.5 mi., widen to 4 lanes, Melrose Park, **$100,000.**

bridge realign, Emerson St. and North Shore Channel, Skokie, **$200,000.**

constr. 3 bridges, Schoenbeck Rd., Elmhurst Rd., Wheeling Rd. at McDonald Creek, Arlington Heights, **$100,000.**

highway separation South Rte. Expressway and South Park Ave. near Cottage Grove Ave., Chicago, **$820,000.**



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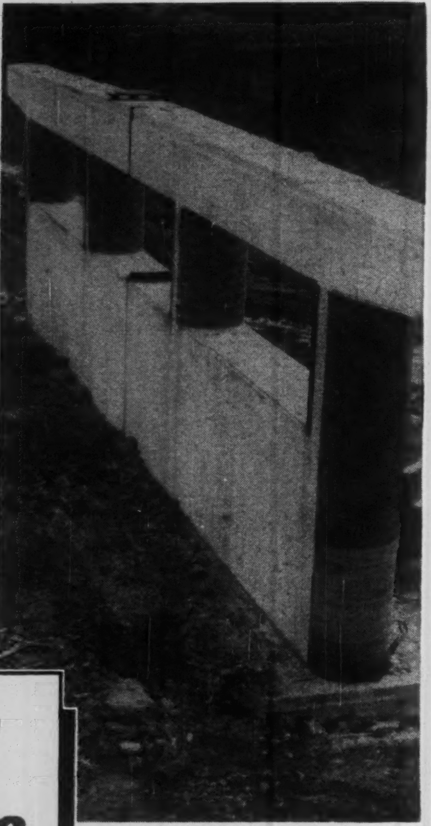

Addison Street Grade Separation
Northwest Expressway, Chicago, Ill.
Contractor: W. E. O'Neil Construction Co.
Architect: Illinois Highway Dept.
Engineer: Alfred Benesch & Associates

On-the-job adaptability makes SONOTUBE Fibre Forms ideal for full-round, half-round, and quarter-round concrete columns, as well as obround columns and pilasters. In addition, these versatile forms are easily sawed to fit wall or beam forms, punched for tie-in rods or anchor bolts, and cut for utility outlets.

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4442

highway separation, South Rte. Expressway (West Leg) at Halsted St., Chicago, **$551,000.**

highway separation South Rte. Expressway (West Leg) Parnell Ave., Chicago, **$390,000.**

railroad separation South Rte. Expressway, and C.R.I. and P. R.R. near 65th St., Chicago, **$4,092,000.** Hugo Stark, 130 N. Wells St., Zone 6, ch. engr. Bids in 1960.

▲ **N. J., Morristown**—Town, Town Hall, overpasses over Ann and Washington Sts. **$1,100,000.**

▲† **Tennessee**—Tennessee Valley Auth., New Sprankles Bldg., Knoxville, bridge over Pickwick Dam. **$2,300,000.**

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto,
St. Catharines—high level bridge over Welland Canal at Homer, near here. **$16,000,000.** Foundation of Canada Engineering Corp. Ltd., 8 Spadina Rd., Toronto, consult. engrs. M. M. Dillon & Co. Ltd., 141 Maple St., London, Ont., and A. M. Lount & Assocs., 164 Eglinton Ave. E., Toronto, Assocs., engrs. CD 5/1/59.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adelaide St. E., replacing steel, concrete deck of Prince Edward viaduct, **$1,000,000.**

STREETS AND ROADS

▲ **Ill., Chicago**—Bd. Comrs. Cook Co., County Bldg.,
road interchange, Palatine Rd. and Elmhurst Rd., Arlington Heights, **$800,000.**

paving Palatine Rd., 2 lanes and medium 6.9 mi. Rohlwing Rd. to Des Plaines River, Arlington Heights, **$700,000.**

reconstr. paving Bartlett Rd. 2 lanes 2.9 mi. County Line to Sutton Rd., Bartlett, **$377,000.**

resurf., widen to 4 lanes, constr. culvert head walls 1 mi. Madison St., Mannheim Rd to 25th Ave., Bellwood, **$205,000.**

resurf. and widen to 4 lanes, .65 mi. Butterfield and Eastern Rds., Mannheim to St. Charles Rds., Bellwood, **$120,000.**

paving Avondale Ave., 4 lanes 2.2 mi. Bryn Mawr to Oliphant Aves., Chicago, **$88,000.**

widen to 4 lanes, resurf. curb and gutter 1.75 mi. Central-Carpenter Rd., Devon to Mulford Aves., Chicago, **$325,000.**

road reconstr., channelize by reducing median 4.2 mi., Crawford Ave., Lincoln Ave. to Central St., Chicago, **$210,000.**

widen, resurf., median 2.4 mi. Cumberland Ave., Irving Park Rd. to Higgins Rd., Chicago, **$545,000.**

paving Glenwood-Dyer Interchange at Calumet Expressway, Chicago, **$220,000.**

repaving, reconstr. to 4 lanes, 2 mi. Homan and Kimball Aves., Division St. to Diversey Ave., Chicago, **$600,000.**

paving, reconstr. 76th St., 0.5 mi. Damen to Ashland Aves., Chicago, **$150,000.**

grading, paving, drainage, lighting, structures, South Rte. Expressway connection with Calumet Skyway Ramp, Chicago, **$2,500,000.**

resurf., widen to 4 lanes 2.1 mi. Greenwood Ave., Milwaukee Ave. to W. Lake St., Glenview, **$475,000.**

resurf., reconstr. to 4 lanes, 47th St. 1.5 mi. County Line to Willow Springs, Hinsdale, **$353,000.**

reconstr., repaving 2 lanes 1.5 mi. 183rd St. to Wentworth Ave., Lansing, **$195,000.**

resurf., widen, curb and gutter 1 mi. Chicago Ave., 17th to 1st Aves., Melrose Park, **$235,000.**

widen, resurf., median Oakton St. 2.4 mi. Milwaukee to Central Aves., Niles, **$545,000.**

resurf., widen to 4 lanes, Harlem Ave., 3.75 mi. Milwaukee Ave. to Glenview Rd., Niles, **$694,000.**

resurf., widen to 4 lanes 0.8 mi. Dundee Rd., Shermer to Skokie Rds., Northbrook, **$182,000.**

paving Lake Cook Rd. 1.5 mi. Milwaukee Ave. to Sanders Rd., Northbrook, **$180,000.**

repaving, widen to 4 lanes Central Ave. 2 mi. 95th to 79th Sts., Oak Lawn, **$650,000.**

repaving, reconstr. to 4 lanes, Chicago Ave., 1 mi. Cedar Rd. to Northwest Hy., Palatine, **$225,000.**

paving, draining Northwest Expressway and Mannheim Rd. interchange, Park Ridge, **$1,130,000.**

paving, draining, lighting Mannheim Rd., Irving Park Blvd. to Higgins Rd., Park Ridge, **$1,700,000.**

widen, resurf. Chicago Rd., 3.5 mi. Marion St. to Sibley Ave., Thornton, **$600,000.**

paving South Rte. Expressway, 87th to 97th Sts., Chicago, **$3,170,000.** Hugo Stark, 130 N. Wells St., Zone 6, ch. engr. Bids in 1960.

▲ **La., Houma**—City, City Hall (P-La-3061) street imprvs. **$1,535,000.** Palmer & Baker Engineers, Inc., P.O. Box 10096, New Orleans, Zone 21, consult. engr.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,
Nassau Co.—constr. 3.1 mi. Nassau Expressway from Queens-Nassau County line southward through Inwood and Lawrence to Atlantic Beach Bridge, FAI Project. **$4,000,000.**

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany,
Rockland Co.—reconstr. 5.7 mi. Rte. 304 between Bardonia and Rte. W9, north of Congers, FAI Project. **$1,500,000 .**

▲ **PENNSYLVANIA**—State Hy. Dpt., 405 North Office Bldg., Harrisburg,
Philadelphia and Bucks Counties—Delaware Expressway. **$110,000,000.** Kneedler, Mirick & Zantzinger, 12 S. 12 St., Phila., Zone 7, archts. CD 2/21/57.

▲ **Wis., Milwaukee**—City, City Hall, street imprvs. **$3,250,000.** Constr. in 1960. E. A. Schmidt, c/o owner, city engr.

EARTHWORK, WATERWAYS

▲ **Massachusetts**—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston, Contr-Tidal Dam & Bridge, Mystic River beyond Wellington Bridge, Medford. **$6,500,000.** Charles T. Main, Inc., 80 Federal St., Boston, engr. CD 6/20/52.

▲ **Pennsylvania**—Dpt. Forests & Waters, Educ. Bldg., Harrisburg,

levees and flood walls, along Moshannon Creek, Philipsburg, Centre Co., Phase 2, **$490,000**; Phase 3, **$400,000.**

channel imprvs. and levee construction Coalport, Clearfield Co., **$362,500.**

culvert and levees, Phase 2, Meadville flood control project, Meadville, Crawford Co., **$700,000.**

channel imprvs. and levee, Connellsville, Fayette Co., **$278,500.**

flood wall along Lackawanna River Scranton, Unit No. 5, Lackawanna Co., **$810,000.**

second stage, imprv. channels and other flood control work on Lackawanna River and Spring Brook, Moosic, Lackawanna Co., **$300,000.**

dams and basins, Susquehanna River tributaries, for flood control purposes, Wyoming, Luzerne Co., **$282,000.**

imprv. channel of Stony Creek and rebuild bridge Norristown, Montgomery Co., **$225,000.**

Phase 2, imprv. channel, construct levees, Susquehanna River and tributaries, Danville, Montour Co., **$1,407,800.**

Phase 2, open concrete channel to carry Sawmill Run into closed conduit Norristown, Montgomery Co., **$500,000.**

dam and basin for flood control relocate utilities, McAdoo, Schuylkill Co., **$306,000.**

Stage 2, levee construction confluence flood control project, Youghiogheny and Casselman Rivers and Laurel Hill Creek, Confluence, Somerset Co., **$240,000.**

levee construction Cowanesque River, Lawrenceville, Tioga Co., **$248,000.**

flood control dam and imprv. channel, tributary of Susquehanna River, Lewisburg, Union Co., **$275,000.**

levee construction for flood control project, Scottdale, Westmoreland Co., **$645,000.** B. D. Murphy, c/o owner, ch. engr.

▲ **Wis., Milwaukee**—Bd. Harbor Comn., harbor imprv., **$2,500,000.** Constr. In 1960. R. C. Krahn, c/o owner, city engr.

AIRPORTS

▲ **Md., Baltimore**—TERMINAL—City, Bureau Aviation, Municipal Bldg., Zone 2, 2 story terminal addn., and 2 story, 40x600 ft. precast concrete pier, Friendship Airport. **$1,000,000.** Whitman Requardt & Assoc., 1304 St. Paul St., Zone 2, consult. engrs. CD 5/20.

† **Tex., Fort Worth**—PAVEMENT—U. S. Eng., 100 W. Vickery Blvd., airfield pavement, Carswell Air Force Base, **$980,000** (funds released). CD 9/28.

LATIN AMERICA

▲ **Mexico, Ciudad Madero**—REFINERY PLANT, etc.—Pemex, Govt. of Mexico, Main Admin. Bldg., Mexico City, refinery plant imprvs., addns., **$55,000,000**, constr. 1960; crude and products lines in vicinity of Ciudad Madero, **$6,000,000.**

PUERTO RICO

▲ **Puerto Rico**—REACTOR—Puerto Rico Water Resources Authority, San Juan, and U. S. Atomic Energy Comn., Oak Ridge, Tenn., U.S.A., demonstration power reactor. **$11,000,000.** General Nuclear Engineering Corp., Dunedin, Fla., U.S.A., made preliminary studies.

AMERICANS ABROAD

▲ **Australia** — RAILWAY REHABILITATION — State of Queensland, Brisbane, rehabilitation 750 mi. Collinsville-Townsville-Mount Isa section Northern Railway. **$67,000,000.** Ford, Bacon & Davis, Inc., 2 Broadway, New York, N. Y., U.S.A., engr.

PUBLIC BUILDINGS

▲ **Ala., Mobile**—HOSPITAL—State of Alabama, Montgomery, **$3,000,000** bond election Feb. 16, 100-bed mental hospital, part of Alabama Medical Center. CD 12/27/57.

Calif., Garden Grove—SCHOOL—Garden Grove High School Dist., 11231 Stanford St., plans by Kistner, Wright & Wright, 1125 6th St., Los Angeles, frame, stucco, comp. roofing, concrete walls, Hazard Intermediate School. **$900,000.**

▲† **Calif., Lompoc**—HOUSING—Procurement Office, Vandenberg Air Force Base, plans by Benedict & Beckler & Assocs., 3501 Cahuenga West, Los Angeles, 400-unit Capehart Housing, Vandenberg Air Force Base (No. 3). **$6,600,000.** CD 4/27.

▲ **Calif., San Jose**—SCHOOL—Eastside Union High School Dist., 57 N. White Rd., plans by Allan Walter & Assoc., 2060 Calmar Way, high school. **$2,000,000.** CD 4/22/55.

▲ **Calif., Stockton**—YOUTH CENTER—State Div. Architecture, 1120 N St., Sacramento, Northern California Youth Center, consisting 12 units. **$2,000,000.**

Colo., Denver—STATE CAPITOL—State Planning Comn., State Capitol Bldg., plans by Joseph W. Pahl, 1168 S. Sheridan Blvd., Denver, state capitol remodeling. **$950,000.**

▲ **Ga., Gainesville**—HOSPITAL—Hospital Auth. of City of Gainesville and Hall County, hospital addn. **$1,467,500.**

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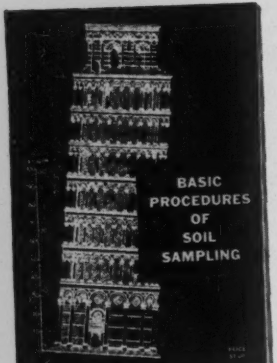

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▲ **Idaho, Mountain Home**—CAPEHART HOUSING—Procurement Office, Mountain Home Air Force Base, plans by Hummel, Hummel & Jones, 1324 Idaho St., Boise, and Neutra & Alexander, 2379 Glendale Blvd., Los Angeles, Calif., 820-units Capehart Housing, Mountain Home Air Force Base, (No. 2), **$13,530,000.** CD 4/27.

▲ **Ill., Belleville** — SCHOOLS — City, City Hall, voted bonds, 3 schools. **$2,673,000.** CD 10/2/58.

Ill., Petersburg—HIGH SCHOOL—School Dist. No. 201, defeated $1,050,000 bonds Nov. 21, high school, **$900,000.** CD 11/7.

Iowa, Storm Lake—HIGH SCHOOL—Bd. Educ. Community School Dist., voted **$945,000** bonds, 1 story, 70,000 sq. ft. high school. Dougher, Frevert & Ramsey, 302 Garver Bldg., Des Moines, archts.

▲† **Me., Limestone**—HOUSING—Procurement Office Loring Air Force Base, plans by Wright & Pierce, Topsham, 114-unit Capehart Housing, Loring Air Force Base (No. 1). **$1,881,000.** CD 4/27.

▲† **Me., Topsham**—HOUSING—Base Procurement Office, Topsham Air Force Station, plans by Kelly & Gruzen, 80 Fifth Ave., New York 3, N. Y., 177 unit Capehart Housing, Topsham Air Force Station. **$2,920,500.**

▲ **Mich., Detroit**—SCHOOLS—Bd. Educ., City Hall,
plans by Eberle M. Smith Assocs., Inc., 153 E. Elizabeth, Detroit, Knudsen Junior High School, **$3,800,000.**
plans by Palmer & Schoettley, 409 Griswold, Detroit, altering Finney School to High School, **$2,500,000.**
plans by Earl C. Meyer, 1306 Michigan Bldg., Detroit, Howell Park Junior High School, **$2,225,000.**
plans by Suren Pilafian, 457 W. Fort, Detroit, Brady-McKerrow School, **$1,000,000.**
plans by Louis Redstone, 10811 Puritan, Berry School, **$1,300,000.**
plans by Meathe, Kessler & Assocs., 15318 Jefferson, Grosse Pointe, Mich., Von Steuden School auditorium, **$750,000.**
plans by Malcomson, Fowler & Hammond, Inc., 1217 Griswold, Detroit, Ruddiman School addn., **$500,000.**
plans by Ralph R. Calder, 1212 Kales Bldg., Detroit, Stoepel Park Junior High Shool, **$2,000,000.**
plans by Stickel, Jaroszewicz & Moody, 286 E. Brown, Birmingham, Moneith School addn., **$700,000.**
plans by Gerard D. Mason & Co., 409 Griswold, Detroit, Chadsey High School addn., **$1,250,000.**
plans by Diehl & Diehl, 120 Madison, Detroit, Howe School addn., **$800,000.**
plans by Gould, Moss & Joseph, Inc., 320 S. Main, Plymouth, Chrysler School, **$600,000.**
plans by Tarapata McMahon, 1591 N. Woodward, Bloomington Hills, Seven Mile-Berg Junior High School, **$3,300,000.**
plans by Norman Krecke, 220 Bagly, Detroit, Condon School addn., **$700,000.**
plans by Harley, Ellington & Day, Inc., 153 E. Elizabeth, Detroit, Poe School, **$1,000,000.**
plans by Ray Ward, 18079 James Couzens, Detroit, Jones School, **$950,000.** CD 4/9.

▲† **Mich., Kincheloe Air Force Base**—HOUSING—Procurement Office, Kincheloe Air Force Base, Sault Ste. Marie, plans by Yost & Taylor, Kenilworth, Ill., 330 units Capehart Housing, Kincheloe Air Force Base (No. 2) (formerly Kinross Air Force Base). **$5,445,000.** CD 4/28.

▲† **Mich., Marquette**—HOUSING—Procurement Office, K. I. Sawyer Air Force Base, plans by J. & G. Daverman, 924 Grandville S.W., Grand Rapids, 370-unit Capehart Housing, K. I. Sawyer Air Force Base (No. 4). **$6,105,000.** CD 4/27.

▲† **Mich., Oscoda** — HOUSING — Procurement Office, Wurtsmith Air Force Base, plans by McGaughan & Johnson, 2000 "P" St. N.W., Wash., D. C., 330-unit Capehart Housing, Wurtsmith Air Force Base (No. 2). **$5,445,000.** CD 4/27.

▲† **Miss., Biloxi**—HOUSING—Procurement Office, Keesler Air Force Base, plans by Landry & Matthes, 214 W. Pine, Hattiesburg, 240-unit Capehart Housing, Keesler Air Force Base (No. 2). **$3,960,000.** CD 4/27.

▲ **Miss., Columbus**—HOUSING—Base Procurement Office, Columbus Air Force Base, plans by Rosamund & Assoc., Propst Bldg., 340-unit Capehart Housing, Columbus Air Force Base (No. 2). **$5,610,000.** CD 4/27.

▲ **Mo., Ferguson** (St. Louis 35 P.O.)—SCHOOLS—Ferguson-Florissant School Dist. R-2, Bd. Educ., 655 January Ave., Zone 35, $4,000,000 bond election Feb. 16, McCluer Junior High School addn., 1890 S. Florissant Rd., Florissant, **$1,900,000;** Junior High School adjacent to 2800 Parker Rd., **$1,900,000.** (**Correction**—election date). CD 12/30.

▲ **Mo., Hazelwood (St. Louis 21 P. O.)**—SCHOOLS—School Dist. of Hazelwood, R-1, Parker Rd. near Old Hall's Ferry Rd., **$1,400,000** bond election Feb. 16, Junior High School addn., elementary school addn., addnl. parking area at high school.

▲† **Mo., Knob Noster**—HOUSING—Base Procurement Office, Whiteman Air Force Base, plans by Eberle M. Smith & Assoc., 153 E. Elizabeth, Detroit, Mich., 350-unit Capehart Housing, Whiteman Air Force Base (No. 2), **$5,775,000.** CD 4/27.

▲ **Mo., Ladue (St. Louis 24 P.O.)**—SCHOOLS—Bd. Educ. School Dist of Ladue, 1201 S. Warson Rd., Zone 24, **$3,300,000** bond election Feb. 9 Junior High School, Ladue and Graeser Rds., Senior High School addn., 1201 S. Warson Rd. and two elementary schools.

▲ **Mont., Glasgow**—COURT HOUSE—Bd. Comrs. Valley Co., court house, Proj. No. P-Mont.-3114, **$1,125,125.** To go ahead September 1960.

▲ **N. J., Cookstown**—SCHOOL—North Hanover Twp. Bd. Educ., plans by Petty & Croft, 39 E. Main St., Moorestown, 4 elementary schools. **$2,500,000.** Louis T.

Klauder, Phila. Nat'l. Bank Bldg., Phila., Pa., consult. engr.

▲ **N. J., Paterson**—SCHOOL—City, City Hall, Westside Park High School, **$3,750,000;** Eastside Park High School, **$3,750,000;** elementary school, Chamberlain Ave., **$1,500,000.** CD 9/17.

▲† **N. M., Clovis**—CAPEHART HOUSING—Procurement Office, Cannon Air Force Base, 160-units Capehart Housing, Cannon Air Force Base. **$2,640,000.** CD 8/27/56.

▲ **N. Y., Albany**—BLDG. NO. 7—State Dpt. P. Wks., State Office Bldg., Zone 1, Bldg. No. 7, Public Works Laboratory (soil mechanics and materials testing). **$3,000,000.** Bids in Spring.

▲ **N. Y., Albany**—MAIN BLDG. NO. 5—State Dpt. P. Wks., State Office Bldg., Albany 1, Main Bldg. No. 5, for Dpt. P. Wks. **$5,300,000.** Bids in six months.

▲ **N. Y., Albany**—OFFICE BLDG. NO. 4—State Dpt. P. Wks., State Office Bldg., Zone 1, Office Bldg. No. 4, for Division of Architecture. **$4,000,000.** Bids in Spring.

▲ **N. Y., Albany**—OFFICE BLDG NO. 8—State Dpt. P. Wks., State Office Bldg., Zone 1, Office Bldg. No. 8 for Dpt. Taxation and Finance. **$13,600,000.** Bids in Fall.

▲ **N. Y., Albany**—OFFICE BLDG. No. 10—State Dpt. P. Wks., State Office Bldg., Zone 1, Office Bldg. No. 10, Motor Vehicle Dpt. **$6,000,000.**

N. Y., Amherst — TOWN HALL — Town, Town Hall, bond referendum Feb. 6, town hall. **$963,775.** CD 12/10.

▲ **N. Y., New York**—SCHOOL—Bureau of Constr., Bd. Educ., 42-15 Crescent St., Long Island City, Proj. E-621, 3 story P.S. 84, 32-72 West 92nd St. and 17-59 West 91st St. **$2,200,000.**

▲† **N. D., Grand Forks**—HOUSING—Procurement Office, Grand Forks Air Force Base, plans by Fox-Stanley Engineering Co., 221 N. 5th St., 366-unit Capehart Housing, Grand Forks Air Force Base (No. 3), **$6,039,000.** CD 4/27.

▲ **O., Bedford**—SCHOOLS—Bd. Educ., 91 Tarbell St., bond election May 3, Moody Junior High School addn., and elementary school, **$1,800,000.** CD 1/29/58.

▲ **O., Kettering**—SCHOOLS—Bd. Educ., bond election May 3, schools, **$4,950,000.** CD 6/26.

▲ **O., Streetsboro**—HIGH SCHOOL, etc.—Bd. Educ., voted $253,135 bonds Jan. 5, high school, grade school, **$1,100,000.** CD 10/19.

▲ **Pa., West Chester**—SCHOOL—West Chester Joint High School Bd., constr. Senior High School, Burke Rd. **$1,000,000.**

▲ **Tenn., Chattanooga**—HOUSING—Chattanooga Housing Auth. plans by Selmon T. Franklin, 421 Poplar, 192 housing units, **$2,000,000.**

▲ **Tenn., Knoxville**—HIGH SCHOOL—Knox Co., high school. **$1,000,000.**

▲ **Utah, Brigham City**—SCHOOL—Box Elder Bd. Educ. plans by Hodgson & Holbrook, 2554 Monroe Blvd., Ogden, high school. **$1,750,000.** Bids in March. CD 6/9/58.

▲ **Wash., Moses Lake**—CAPEHART HOUSING—Procurement Office, Larson Air Force Base, plans by McClure & Atkinson, Sherwood Bldg., Spokane, 330-units Capehart Housing, Larson Air Force Base (No. 2), **$5,445,000.** CD 4/27.

Wash., Yakima—SCIENCE AND FINE ARTS, etc.—School Dist. No. 7, 104 N. 4 Ave., plans by Cowan & Paddock, Larson Blvd., science and fine arts bldgs. and gymnasium addn. for Yakima Valley Junior College. **$900,000.** Bids this year.

▲ **Ont., Sudbury**—CITY HALL—City, 83 Cedar St., city hall. **$1,000,000.**

▲ **Que., Quebec City**—POST OFFICE—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by Maurice Mainguy, 175 St. Jean St., and Leo Turcotte, 466 de la Couronne St., 5 story, 122,000 sq. ft., 164 x 234 ft. rein.-con. with granite walls post office, **$3,000,000-$5,000,000.** CD 1/23/56.

COMMERCIAL BUILDINGS

▲ **Ark., Pine Bluff**—STORE—Gus Blass, 4 and Main St., Little Rock, department store, 20 acre site, Twenty-seventh, Main, Twenty-ninth and Olive Sts. **$3,000,000.**

▲ **Calif., Pacifica**—APARTMENTS—Grove Heights Development Co., 1366 Hillcrest Blvd., Millbrae, plans by Harold C. Dow, 884 Forester St., San Francisco, 12 two story apartments, Adobe Dr., Pedro Valley. **$1,000,000.** Charles E. Randlett, 670 Marshall Court, Redwood City, consult. engr.

▲ **Calif., San Francisco**—HOSPITAL—French Mutual Benevolent Society, French Hospital, 5th Ave. and Geary Blvd., plans by John Carl Warnecke & Assocs., 111 New Montgomery St., and Rex Whitaker Allen, 693 Mission, 4 story 200 bed, 94,500 sq. ft. rein.-con., masonry, glass, etc. French Hospital. **$2,000,000.** Smith & Moorhead, 709 Mission, consult. engrs. CD 1/3/58.

▲ **Calif., San Francisco**—MART—Kratter Corp., c/o Merchandise Mart, 1355 Market, 40,000 sq. ft. Mart addn. **$1,000,000.** Constr. 1961.

▲ **Conn., Danbury**—HOTEL—A. B. Samuels, 706 Bostwick Ave., Bridgeport, plans by Kane & Fairchild, 734 Asylum Ave., Hartford, 3 story 100-room hotel, 198 Main St. **$1,250,000.** CD 6/26.

(Continued on page 178)

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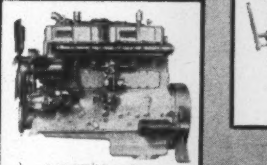
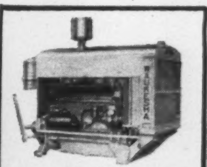
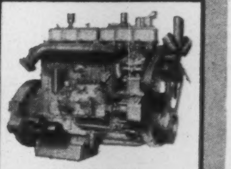

145-GZB Gasoline
6-cyl., 5⅜ x 6-in.,
817 cu. in. displ.


135-DKU Diesel
6-cyl., 4¼ x 5-in.,
426 cu. in. displ.


148-DKB Diesel
6-cyl., 5¼ x 6-in.,
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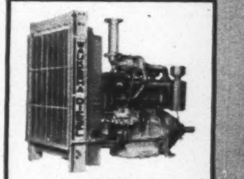
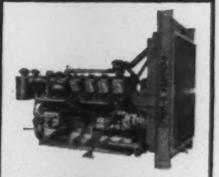
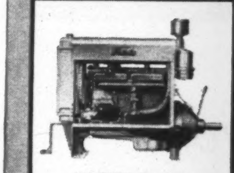
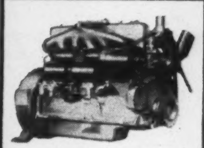
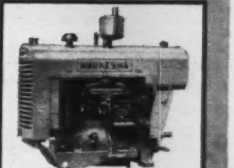

WAKDBSU Diesel
6-cyl., turbosupercharged
6¼ x 6½-in., 1197 cu. in.


VLRDBU Diesel
V-12, 8½ x 8½-in.,
5788 cu. in. displ.


140-GKBU Gasoline
6-cyl., 4½ x 5½-in.,
525 cu. in. displ.


195-DLC Diesel
6-cyl., 4 x 4-in.,
302 cu. in. displ.


180-GKBU Gasoline
4-cyl., 3⅜ x 3¾-in.,
155 cu. in. displ.

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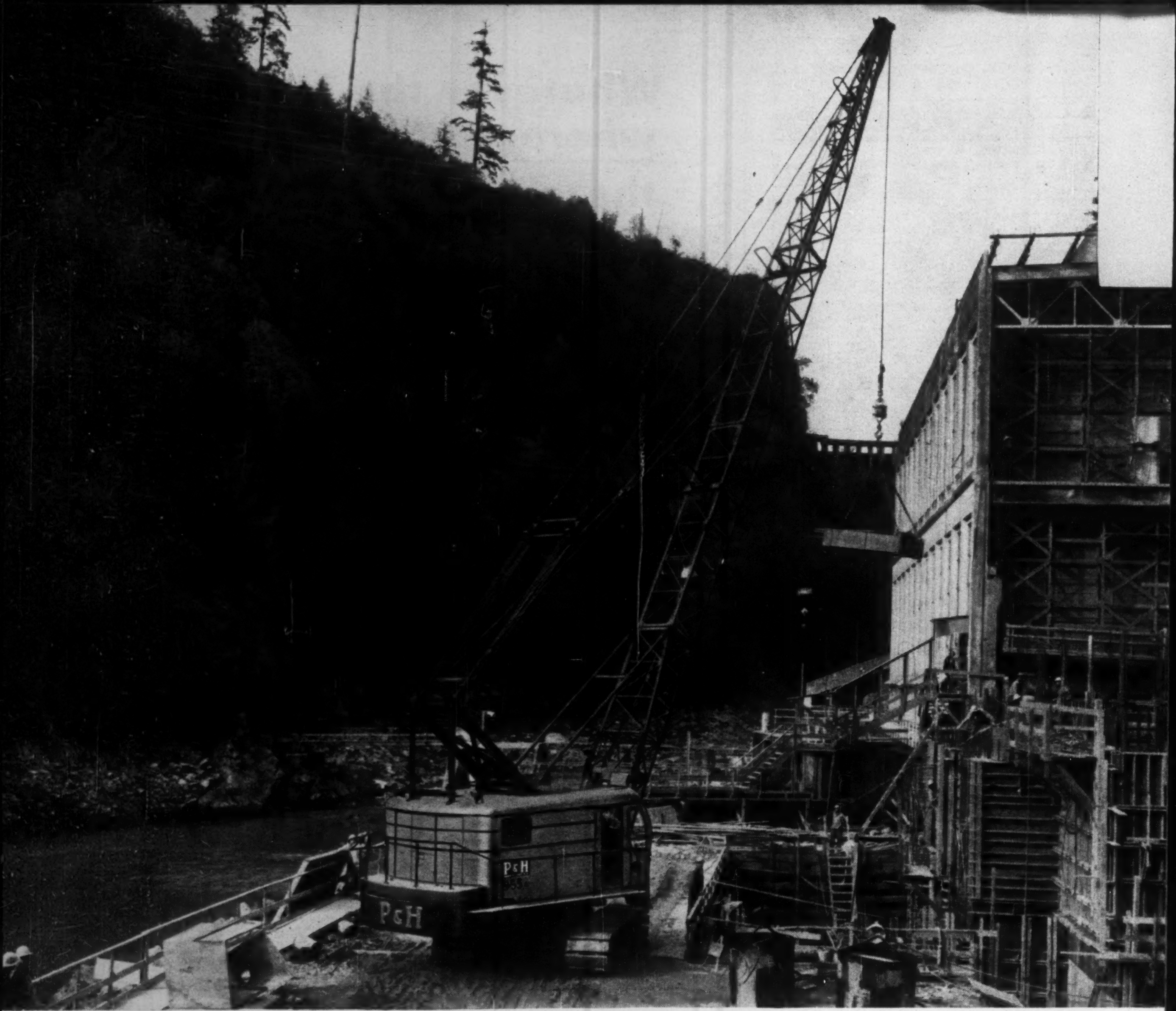

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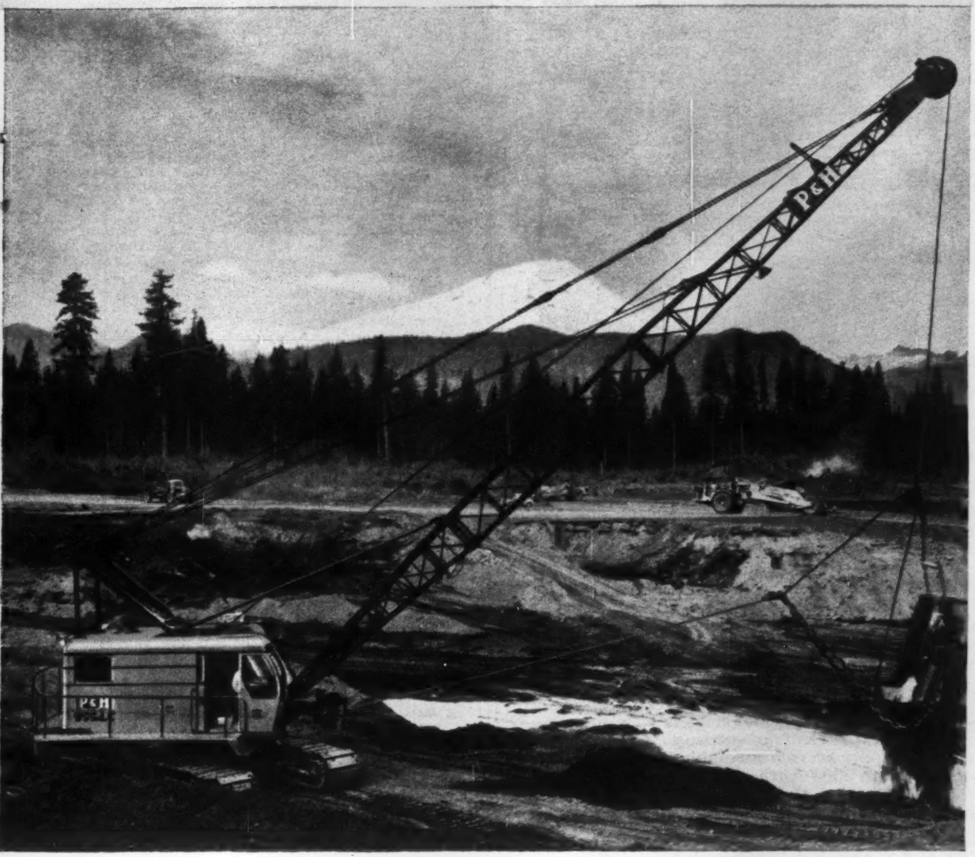

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JOHNSON & DEALAMAN, INC.
Newark 5, New Jersey
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Albuquerque, New Mexico
CONTRACTORS' SALES CO., INC.
Albany 4, New York
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RALPH C. HERMAN COMPANY
Marlboro, New York
P-D SERVICE, INC., **Pavilion, N. Y.**
CREDLE EQUIP. POTSDAM CORP.
Potsdam, New York
CREDLE EQUIPMENT, INC.
Utica, N. Y.
BUCK EQUIPMENT COMPANY
Statesville, N. C.
GENERAL DIESEL & EQUIP. CO., INC.
Fargo, North Dakota
BOARDMAN MACHINERY COMPANY
Oklahoma City 7, Oklahoma
LOGGERS & CONTRACTORS MACHINERY CO. **Portland 14, Ore.**
STEPHENSON EQUIPMENT, INC.
Harrisburg, Pennsylvania
A. T. GREEN MACHINERY COMPANY
Pittsburgh 23, Pennsylvania
C. C. & F. F. KEESLER
Prospect Park, Pennsylvania
ROADBUILDERS' EQUIPMENT, INC.
Columbia, South Carolina
PECAUT EQUIPMENT COMPANY
Sioux Falls, South Dakota
SOUTHLAND TRACTORS, INC.
Memphis, Tennessee
REYNOLDS COMPANY
Nashville, Tennessee
PLAINS MACHINERY COMPANY
Amarillo, Texas
CENTRAL TEXAS EQUIPMENT CO.
Austin, Texas
LUMBY MACHINERY COMPANY
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PEARCE EQUIPMENT CO. OF TEXAS
Houston, Texas
CATE-CARBON EQUIPMENT CO.
Price, Utah
CATE EQUIPMENT COMPANY
Salt Lake City 1, Utah
AIR MAC, INC., OF WASHINGTON
Seattle 4, Washington
CARRINGTON COMPANY
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RISH EQUIPMENT COMPANY
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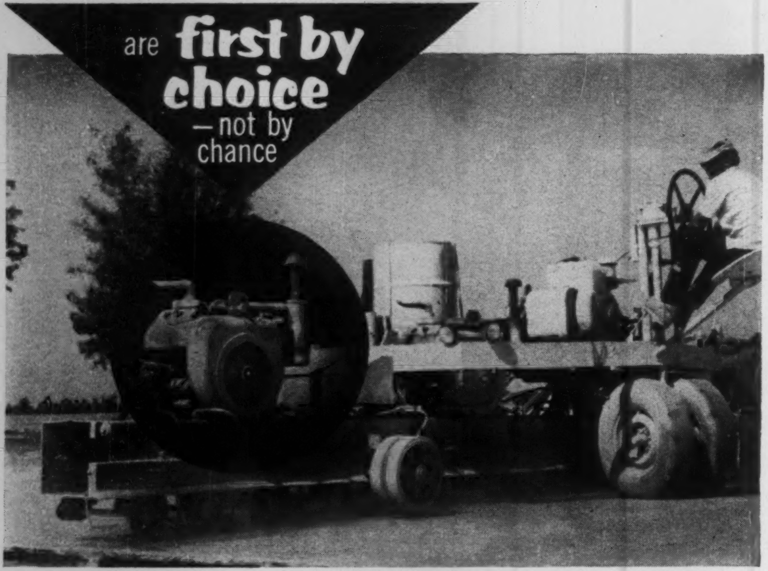
WISCONSIN ENGINES



SELF-POWERED 16-BLADE SAW — the newest in paving tools, made by Cutcrete Manufacturing Co., El Monte, Calif. — has four Wisconsin Engines, three 37-hp units and one 18-hp. User reports: No concrete has been found yet that is hard enough to lug these engines down!

The number of Wisconsins used in construction is apt to make you wonder whether anyone else makes engines in the 3- to 56-hp class. They do — but not like Wisconsin builds them. And leading builders of construction equipment know it.

This OEM preference is based on the all-around quality and dependability of Wisconsin engines — not price. Builders know that Wisconsin power protects the service reputation of their machines as well as your continued good-will.

Heavy-duty, precision-fitted engine construction assures smooth, dependable power and minimizes wear. Basic high torque provides load-lugging power that enables the engine to slug through sudden shock loads without stalling or damage — and keeps men and machines working.

Air-cooling eliminates freeze-ups and dry-ups. You won't need water or anti-freeze. You just start the engine — whether it's 35° F. below zero or 140° F. above — and let it run!

Specify Wisconsin air-cooled engines on the equipment you buy. Sizes from 3- to 56-hp. — single,- two-, and V-type four-cylinder models — with manual or electric starting. Convenient, expert service available through more than 2000 Authorized Service Stations. Send for Bulletin S-249. Write Dept. C-10.

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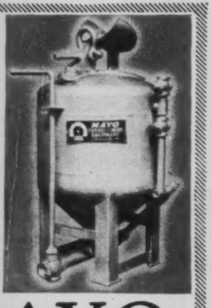

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Structural Steel
BRIDGES and BUILDINGS

General Office
and Shops
PHOENIXVILLE, PA.

Subsidiary—Phoenix Steel Corporation

(Continued from page 175)

▲ **Conn., East Windsor**—SHOPPING CENTER—Joseph Croog Co., Inc., 9 Center St., New Haven, 100,000 sq. ft. shopping center, Stoughton Rd. **$1,000,000.**

▲ **D. C., Wash.**—BANK—Riggs National Bank, 1530 Pennsylvania Ave. N.W., plans by Mills, Petticord & Mills, 3308 14 St. N.W., Lincoln Branch Bank, 17 and H Sts. N.W. **$1,000,000.**

▲ **Fla., Bradentown**—HOME—Presbyterian Synod, c/o Rev. B. L. Bowman, Whitfield Estates, Presbyterian Church, 8244 N. Tamiami Trail, home for retired ministers, **$1,250,000.** To go ahead 1960.

▲ **Fla., St. Petersburg**—APARTMENT—Braunstein-Lipman Enterprises, Inc., 1025 Kan Cor., Bay Harbor Isle, Miami Beach, 10 story, Carlton Towers Apartment, incl. airconditioning, parking and swimming pool, 5 Ave. S and 2 St. **$4,000,000.**

▲ **Hawaii, Honolulu**—HOME and HOTEL—Hawaii Pacific Homes, 843 Fort St., plans by Lemmon, Freeth, Haines & Jones, Kenrock Bldg., 14 story home and hotel for retired people, Kaneohe. **$3,000,000.** CD 7/16.

▲ **Hawaii, Honolulu**—HOTEL—Sheraton Hotels, Inc., Royal Hawaiian Hotel, plans by Wimberly & Cook, 315 Royal Hawaiian Ave., 18 story, 1,000 room hotel, fresh water swimming pool. **$15,000,000.** CD 10/28.

▲ **Ill., Belleville**—SANCTUARY, etc.—Hillcrest Christian Church, 7401 W. Main St., plans by William M. Cooley & Assocs., 532 Busse St., Park Ridge, sanctuary, two educations bldgs., recreational and workshop facilities, **$1,000,000.**

▲ **Ind., Bloomington**—SHOPPING CENTER, etc.—Gust Lycas, 3141 Washington Blvd., Indianapolis, Colonial Hill Plaza Shopping Center, 1800-car parking, 25-acre, north of 17th between Walnut and Dunn Sts. **$3,000,000.**

▲ **Ind., Indianapolis**—APARTMENTS—Stewart Bainum, 3508 E. 38 St., eight 100-unit apartments, 3-acre site, 39th St. and Sherman Rd. **$1,000,000.**

▲ **Ky., Louisville**—APARTMENTS—Paul M. Kendall, 422 W. Liberty St., Zone 2, 155 garden apartments, 9 hole golf course, swimming pool, near here. **$1,000,000.**

▲ **La., New Orleans**—OFFICE—Owner, c/o Mort J. Walker, atty., National Bank of Commerce Bldg., plans by Dibolls-Kessels, 637 Pere Antione Alley, 21 story office, Common and N. Rampart Sts. **$2,000,000.**

▲ **Md., Baltimore**—HOSPITAL—Mercy Hospital, Saratoga and Calvert Sts., Zone 2, plans by Taylor & Fisher, 130 W. Hamilton St., Zone 1, Phase III, 12 story, steel, concrete block hospital. Over **$1,000,000.** Henry Adams, Inc., 2315 St. Paul St., Zone 8, mechanical engr. V. R. P. Saxe, 1701 St. Paul St., Zone 2, structural engr. CD 8/13/56.

▲ **Mass., Cambridge**—EARTH SCIENCE—Massachusetts Institute of Technology, 77 Massachusetts Ave., plans by I. M. Pei & Assoc., 385 Madison Ave., New York, N. Y., earth science bldg. **$5,000,000.** Constr. 1960. CD 4/9.

▲ **Mass., Danvers** — SHOPPING CENTER — Elm Farm Foods Co., 600 Columbia Rd., Dorchester, plans by Sumner Schein, 271 Huntington Ave., Boston, shopping center, off Endicott St. **$1,200,000.** Constr. 1960.

▲ **Mass., Norton**—FINE ARTS—Wheaton College, Norton, plans by Rich & Tucker Assocs., 45 Newbury St., Boston, Fine Arts Bldg., Campus. **$1,000,000.** Constr. 1960. CD 9/9/58.

▲ **Mo., Kansas City**—HOTEL—Trianon Co., Hotel Muehlebach, Kansas City, Mo., plans by Neville, Sharp & Simon, 25 E. 12th, 15-story Muehlebach hotel addn., known as Muehlebach South. **$2,000,000.** CD 1/13.

▲ **N. J., Elizabeth**—BOWLING ALLEY—Fred Plenge, 2293 Westfield Ave., Scotch Plains, 40-lane bowling alley, West Grand St. **$1,250,000.** CD 6/30/58.

▲ **N. J., Elizabeth**—APARTMENT—Samuel Rappaport, 76-10 34 Ave., Jackson Heights, N. Y., plans by Erwin Gerber, 11 Commerce St., Newark, 14 story apartment, West Jersey St. **$3,000,000.**

▲ **N. J., Erlton**—SHOPPING CENTER—Robert Scarborough, Marlton Pike, Delaware Twp., plans by Hassinger & Schwam, 27 Maplewood Ave., Phila., Pa., shopping center, Rte. 70, **$1,000,000.**

▲ **N. J., Hammonton**—HOUSES—Richard S. Robbins Co., c/o Mrs. Marjorie Helsel, 1 University Place, New York, N. Y., plans by Campbell & Wong, 737 Beach St., San Francisco, Calif., 500 houses, near here. **$3,500,000.** Constr. in 1960.

▲ **N. Y., Farmingdale**—CLASSROOM BLDG., etc.—Polytechnic Institute of Brooklyn, 333 Jay St., Brooklyn, plans by Eggers & Higgins, 100 E. 42nd St., New York, classroom bldg., library, laboratories, Graduate Engineering School. **$1,200,000.**

▲ **N. Y., New York**—APARTMENTS—Banner Holding Corp., 23 Court St., Brooklyn, Zone 2, plans by Philip Birnbaum, 12 E. 48th St., Zone 17, two 20 story apartments, 505-07 and 509-13 East 79th St. **$2,800,000.**

▲ **N. Y., New York**—APARTMENT—168 Third Ave. Realty Corp., 175 W. 72nd St., Zone 23, plans by Philip Birnbaum, 12 E. 48th St., Zone 17, 20 story apartment for 250 families, 144 E. 17th St. **$1,000,000.**

▲ **N. Y., New York**—APARTMENT—Senville Realty & Constr. Co., 360 Lexington Ave., Zone 17, plans by Schuman & Lichtenstein, 360 Lexington Ave., Zone 17, 21 story apartment, westside of Avenue of Americas from W. 56 to W. 57 Sts. **$2,800,000.**

▲ **N. Y., New York**—OFFICE—250 Broadway Co., 521 Fifth Ave., Zone 17, plans by Richard Roth, 400

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Park Ave., Zone 22, office, 239-50 Broadway. $7,000,000.

▲ **N. Y., Rochester**—DIAGNOSTIC AND TREATMENT CENTER—University of Rochester, River Blvd., 4 story diagnostic and treatment center for chronically ill. **$1,317,220.** Constr. in March. CD 7/17/56.

▲ **N. Y., Woodmere**—SCHOOL—Yeshiva of the South Shore, Oak St., school, Broadway and Pine St. **$1,000,000.**

▲ **N. C., Wilmington**—LIBRARY-STUDENT ACTIVITY—Wilmington College, 1210 Market St., plans by Leslie N. Boney, 120 S. 5th St., and Ballard & McKim, 612 S. 17th St., 69,000 sq. ft. library-student activity bldg. **$1,000,000.** George B. Rottman, 1844 Pembroke Rd., Greensboro, plumbing, heating, air-conditioning engr. CD 7/21.

▲ **O., Cincinnati**—OFFICE—Western & Southern Life Insurance Co., 400 Broadway, plans by Hake & Hake, 2400 Gilbert St., 7 story, 130,000 sq. ft. home office addn. **$3,000,000.**

▲ **O., Columbus**—MOTEL—Certified Franklin Corp., 30 E. Town St., 225-unit motel, incl. swimming pool, Scioto Downs harness track, 6000 S. High St., **$2,800,000.**

▲ **O., Dayton** — SCHOLASTICATE, etc. — Society of Mary, 4370 Patterson St., 250 student scholasticate, gymnasium. **$2,000,000.**

O., Massillon—HOMES—Standard Housing Corp., 2707 30 St. N. W., Canton, 77 homes, 16 St. SE to be known as Happy Hills, **$924,000.**

▲ **O., Mayfield Heights**—SHOPPING CENTER—Morris Coen & Leo Bilsky, c/o Mayflower Lanes, 13961 Cedar Rd., Cleveland, Zone 18, Eastgate Shopping Center, incl. 52 bowling lanes, archery courts, miniature golf course indoor driving range, swimming pool. **$2,000,000.** CD 7/8.

▲ **Pa., Enola**—HOUSING—Stuart M. Hoagy, Inc., 364 Market St., Lemoyne, 200 housing units, Mountain View Estates, East Pennsboro Twp. **$4,000,000.**

▲ **S. C., Charleston**—SHOPPING CENTER—Owner, c/o Sanford Olasoz, agt., Peoples Bldg., shopping center, **$1,500,000.**

▲ **Tenn., Knoxville** — APARTMENT — Brown-Brown & West Realtors, Empire Bldg., plans by Barber & McMurray, 2505 Kingston Pike, 50-unit apartment. **$1,250,000.**

▲ **Tex., Abilene**—MALL SHOPPING CENTER—Downtown Abilene Markets, Inc., c/o F. C. Olds Co., archt., 325 Hickory St., No. 1, 130,000 sq. ft. mall shopping center, 175,000 sq. ft. air-conditioned mall, **$1,100,000;** No. 2, mall shopping center, **$1,000,000.**

▲ **Tex., Dallas**—SHOPPING CENTER—Bazaar Northwest Inc., 4700 Abbott St., plans by Welton Beckett & Assocs., 5657 Wilshire, Los Angeles, Calif., and Jack Corgan & Assocs., 308 Tower Petroleum Bldg., Dallas, 500,000 sq. ft., masonry shopping center, across from Bachman Lake. **$6,000,000.**

▲ **Tex., El Paso**—DWELLINGS, etc.—Arthur Rubloff & Co., 100 W. Monroe St., Chicago, Ill., and Horizon Land Co., 199 N. Stone Ave., Tucson, Ariz., plans by Lucio Costa, Brasilia, Brazil, and Nicholas Sakeller, Arizona Land Title Bldg., Tucson, Ariz., Horizon City, 400 dwellings, **$5,500,000;** shopping center, **$1,000,000;** golf course, country club, **$500,000.**

▲ **Tex., Houston**—OFFICE, etc.—Klein Assocs., 2330 W. Holcombe Blvd., 12 story office, parking garage, Holcombe Blvd. and Greenbriar St. **$2,750,000.**

▲ **Tex., Houston**—BANK, etc.—River Oaks State Bank, 2119 Westheimer Rd., plans by Harry A. Turner & Charles E. Geyer Assocs., 2502 Robinhood Rd., 16 story, bsmnt., 467,000 sq. ft., structural steel, bank-store-office, swimming pool, parking garage, heliport, 3100 block Kirby Dr. **$10,000,000.** H. E. Bovay, Jr., 5009 Caroline St., consult. engr. CD 3/12.

▲ **Tex., Houston**—APARTMENT—Shana Royal Apartments, c/o Cooke Constr. Co., 5105 Gulfton St., 107 unit brick apartment, 1400 block Post Oak Rd. **$1,250,000.** Edminster Engineering Co., 2610 Sunset Blvd., consult. engr.

▲ **Tex., San Antonio**—MOTOR-HOTEL—R. Dumas Milner, 437 N. Flores St., plans by Tom E. Stanley, 904 Fort Worth Ave., Dallas, 330 room garden type motor-hotel, **$5,000,000;** park patio and swimming pools, **$90,000;** outside lighting sys., **$90,000.** CD 1/11.

▲ **Tex., San Antonio**—OFFICE—Owner, c/o DeVerne Reed Kittles, archt., 1535 Contour Drive, 3 story, penthouse, office, Basse Rd. and San Pedro Ave., **$1,500,000.** CD 8/3

▲ **Utah, Provo**—ARTS CENTER—Brigham Young University, Provo, plans by William L. Pereira & Assoc., 12/31 W. 5th, Los Angeles, Calif., 232,188 sq. ft. arts center. **$2,000,000.** CD 12/11/57.

▲ **Wash., Bremerton**—RETIREMENT HOME—First Methodist Church, 502 Pacific Ave., plans by Branch, Branch & Garrison, 2616 E. 11 St., retirement home. **$1,000,000.** CD 5/28.

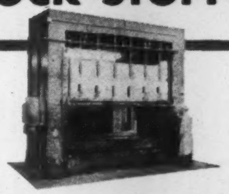
Wash., Pullman—HOUSES—United Builders, 1005 N. 1 St., Yakima, 75 houses on northwest outskirts of city, **$900,000.** Constr. in Spring.

▲ **Wash., Spokane** — SHOPPING CENTER — Western Bldrs. Co., W. 1716 Francis St., plans by Warren C. Heylman, W. 1023 Riverside, 102,000 sq. ft. Five Mile Shopping Center addn. **$1,000,000.** CD 3/26.

▲ **Wyo., Thermopolis**—MOTOR HOTEL—Rocky Mountain Hotel Co., Inc., c/o F. M. Barnes, 150-room motor hotel, swimming pool. **$1,000,000.**

▲ **Ont., Fort William**—HOUSES—Gateway Developments Co. Ltd., 211 S. Syndicate Ave., 100 houses, Lakehead area, **$1,400,000.**

PUNCH PRESS SHOCK STOPPED



Problem: To cushion the dangerous shock of this 400-ton capacity Clearing Press at the RCA-Whirlpool-Seeger Plant in St. Paul, Minn.

Solution: Unique Resilient Mounting by Korfund System engineers. It protects the structure, nearby equipment, personnel and the press itself from any shock damage. Substantial savings of money were effected, too, since no special foundations or costly reinforcement were needed.

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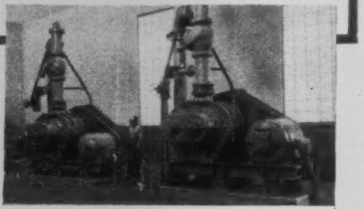

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MONTREAL 32, QUEBEC, CANADA

▲ **Ont., Port Arthur**—HOUSING—Headway Builders, Ltd., 63 Cumberland St. S., housing development, Lakehead area, **$2,000,000.**

▲ **Ont., Toronto**—REHABILITATION CENTER—Society for Crippled Children, 92 College St., plans by Stanford & Wilson, 90 Eglinton Ave. E., 175,000 sq. ft. 105-bed rehabilitation center, Bayview Ave., 10 acres adjoining property of Canadian National Institute for Blind, **$2,000,000.** Reicher, Bradstock & Assocs., Ltd., 612 Sherbourne St., engrs. Bids in **1960. CD** 6/19/57.

INDUSTRIAL BUILDINGS

▲ **Conn., Waterbury** — RESEARCH CENTER — **American** Brass Co., 414 Meadow St., research center, Freight St. **$1,500,000.**

▲ **Ill., Illiopolis**—PLANT—Borden Chemical Co., 350 Madison Ave., New York 17, N. Y., polyvinyl chloride plant. **$4,000,000.**

▲ **La., Baton Rouge**—PLANT—Foster Grant Co., Inc., Scenic Hy., styrene plant enlargement. **$3,000,000.** Constr. 1960. CD 2/8/56.

▲ **Mo., Kansas City**—DRUG WAREHOUSE—Katz Drug Co., 1130 Walnut, Kansas City, Mo., plans by Kivett, Myers & McCallum, 1016 Baltimore, Kansas City, Mo., 1 story, concrete, glass drug warehouse, automatic loading and unloading sys. **$1,000,000.**

▲ **N. Y., Northport**—PLANT—Long Island Lighting Co., 250 Old Country Rd., Mineola, 185,000 kw. generating plant. **$40,000,000.**

▲ **O., Toledo**—POWER PLANT—Toledo Edison, Edison Bldg., 3rd generating unit, Bay Shore Power Plant, East Toledo. **$28,000,000.**

▲ **Pa., Bryn Mawr**—RESEARCH—Bryn Mawr Hospital plans by Kneedler, Mirick & Zantzinger, 12 S. 12 St., Phila., Zone 7, research bldg., administration wing, maintenance bldg., off-street parking. **$1,500,000.**

▲ **Pa., Feasterville** — PLANT — Mrs. Paul's Kitchens, 5830 Henry Ave., Phila., 250,000 sq. ft. frozen food plant. **$2,000,000.**

▲ **Tex., Falls City**—PLANT—Susquehanna-Western, Inc., 777 Grant St., Denver, Colo., uranium ore processing plant, **$2,500,000;** earthwork for uranium plant and site area, **$60,000;** water system, **$55,000,** near here.

▲ **Wis., Milwaukee**—SERVICE CENTER—Milwaukee Gas Light Co., 626 E. Wisconsin Ave., plans by Fritz von Grossman, 5455 W. Burleigh St., 1 story, 259 x 400 ft., concrete, steel, brick service center, **$1,000,000.**

UNCLASSIFIED

▲ **Minnesota**—ELECTRIC DISTRIBUTION SYS., etc.—Northern States Power Co., 15 S. Fifth St., Minneapolis, Minn.,
electric distr. sys. imprv., St. Paul Area, **$2,000,000.**
rebuild 115,000 volt lines from High Bridge plant to Rogers Lake, (South St. Paul) and Red Rock, **$350,000.**
electric distr. sys. addns. Minneapolis and Area, **$3,750,000.**
rebuild 18.5 mi. 69,000 volt transmission line between Waterville and generating station, Mankato, **$320,000.**
rebuild 21 mi. 69,000 volt transmission line from Kenyon Substation to Dodge Center, Minn. Substation. **$200,000.**
second transformer in West Faribault Substation, Faribault, **$283,000.**
34 mi. 115,000 volt transmission line Black Dog Generating Plant to Carver County Substation, **$1,000,000,** Constr. 1961.
double capacity of Champlin Substation which serve Anoka and SE Anoka Area, **$227,000.**
increasing transformer and feeder capacity Substation Champlin, **$176,000.**
addn. equipment and new feeder lines to Oliver Substation, Minneapolis, **$92,000.**
increasing capacity of North Minneapolis Area served by Penn Substation, entailing conversion of present 4,160 volt lines to 13,800 volts, etc., Minneapolis, **$200,000.**
installing cables from Aldrich Substation to downtown network, **$142,000.**
increasing capacity of service from Main St. Substation to downtown network, Minneapolis, **$120,000.**

▲ **Minnesota**—NATURAL GAS LINE, etc.—Northern States Power Co., 15 S. Fifth St., Minneapolis,
natural gas line imprv., St. Paul Area, **$4,000,000.**
providing natural gas pipe line, Moorhead, **$285,000.**
providing natural gas service thru connection with feeder line, East Grand Forks, **$100,000.**
90,000 gal. propane tanks, two at Maplewood Plant and three at Sibley Plant, St. Paul, **$300,000.**
2- to 6-in. gas mains 60 mi., St. Paul, **$3,730,000.**

▲ **Missouri**—NATURAL GAS, etc.—Laclede Gas Co., 1017 Olive St., St. Louis, Zone 1, underground natural gas storage reservoir, near Hallisville, **$1,300,000.**

▲ **N. J., Merchantville** — CLUBHOUSE, etc. — Garden State Racing Assoc., Haddonfield Rd. and St. Hy. No. 70, 3 story, 125 x 300 ft., brick, masonry, steel clubhouse and grandstand addn. **$1,500,000.**

▲† **Wash., Seattle** — SCIENCE EXHIBIT, etc. — Dpt. Commerce, Wash. 25, D. C., government science exhibit and building, Century 21 Exposition. **$9,000,000** appropriated.

▲ **Wisconsin**—NATURAL GAS PIPE LINE—Northern States Power Co., 15 S. Fifth St., Minneapolis, Minn., natural gas pipe line, Menomonie, **$550,000;** natural gas pipe line, Chippewa Falls, **$400,000;** natural gas pipe line, Eau Claire, **$1,225,000.** H. Hill, c/o owner, engr.

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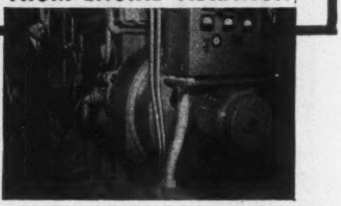

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CONSTRUCTION REPORTS

Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
February 3 Maine February 6 Connecticut

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 1/19, **Campanella & Cardi Constr. Co.**, 780 Jefferson Blvd., Warwick, R. I., LB **$2,389,977**, est. $2,733,943, hy. and bridge Lowell Connector, U-358-2, Chelmsford-Lowell. CD 1/8.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, Bids opened 1/19, **J. F. White Contg. Co.**, P. O. Box 358, Westwood, Mass., LB **$2,931,760**, est. $3,341,154, hy. and bridge constr. F-355(8) Hanover, Norwell, Rockland and Hingham. CD 1/6.

▲ **Connecticut Light & Power Co.**, Selden St., Berlin, Conn., Owner Builds, **$2,450,000**, rebuild and convert 69 KV transmission line from Montville to Willimantic; **$220,000**, transmission ilne, Frost Bridge Substation Thomaston to Southington, CONNECTICUT. CD 1/29.

BUILDINGS—LB & CA

F. W. Cunningham & Sons, 181 State St., Portland, Me., CA **$924,458**, MEN'S DORMITORY, University of Maine, ORONO, ME. State, Dpt. Educ., State House, Augusta, Me. Bids Dec. 21, awarded Jan. 7. CD 12/29, under LB.

▲† **C. W. Regan, Inc.**, 327 Hewes St., Brooklyn, N. Y., LB **$2,264,000**, COLD REGIONS RESEARCH LABORATORY, ENG-19-016-60-37, HANOVER, N. H. U. S. Eng., 424 Trapelo Rd., Waltham, Mass. Bids Jan. 19. CD 1/5.

▲ **Aunt Hack Ridge Estates, Inc.**, Aunt Hack's Hill Rd., Danbury, Conn., Owner Builds, **$2,600,000**, 260 HOUSES, "Aunt Hack Ridge Estates," Aunt Hack's Hill Rd., recreational area, incl. baseball field, roads, etc., DANBURY, CONN. CD 11/16.

▲ **C. & C. Constr. Co.**, 239 Main St., East Haven, Conn., Owner Builds, **$1,813,790**, 121 HOUSES, "Pine Grove," Second Section, Clintonville Rd., NORTH HAVEN, CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
February 19 Pennsylvania
STREETS AND ROADS
February 18 New York February 19 Pennsylvania

▲ **New York**—BA 2/18—Power Authority of State of New York, The Coliseum Tower, 10 Columbus Circle, New York, Zone 19, constr. South Approach Rd. and Lewiston Rd. from Devil's Hole to Lewiston Power Plant, Lewiston and Niagara Falls, Niagara Co., Spec. No. PA-N-23038, Niagara Contr. N26. Plans $10 per initial set, $5 per set for addnl. sets, not refundable. Uhl, Hall & Rich, 230 Congress St., Boston 10, Mass., engrs. CD 8/15/57.

BUILDINGS—BA

▲ **N. Y., New York**—POLICE ACADEMY—BA 2/3—Dpt. P. Wks., Rm. 2200, Municipal Bldg., Zone 7, general contract plumbing work, heating and ventilating and air-conditioning, electrical work new Police Academy and replacement for 13th and 15th Precincts located at E. 20th and E. 21st Sts. between 2d and 3d Aves., Manhattan Boro. Extended date. Plans deposit $80. CD 12/22.

▲ **N. Y., New York**—SCHOOL—BA 2/18—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general contract, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures Public School 101, East 111th St. between Lexington and Park Aves., Manhattan Boro. Plans deposit $25 general, $10 each trades.

▲ **Pa., Freeport**—SCHOOL—BA 2/18—Public School Bldg. Auth., 101 S. 25 St., Harrisburg, Secondary School Bldg. for Freeport Area Joint School Bd., Proj. 819-575. $1,000,000. Plans deposit $50. W. F. Rittenhouse, Vine and N Jefferson Sts., Kittanning, archt. CD 12/18/58.

N. Y., North Merrick—SCHOOL—BA 2/11—Diocesan Bldg. Comn., 253 Sunrise Hy., Rockville Centre, Sacred Heart School. $900,000. Ferrenz & Taylor, 1451 Broadway, New York, Zone 36, archts.

▲ **N. Y., New York**—BUS STATION—BA 2/16—Port of New York Authority, 111 Eighth Ave., Zone 11, supply and erection structural steel for George Washington Bridge Bus Station adjacent to New York Plaza of George Washington Bridge, Contr. GWB-200.012. Plans deposit $30. CD 2/20/57.

▲ **Del., Wilmington**—SCHOOL—BA 2/18—Wilmington Bd. Educ., 511 W. 8 St., elementary school, 17 and West Sts. $1,000,000. Plans deposit $45. Walter Carlson, 1014 Delaware Ave., archt. CD 4/3.

(Continued on page 184)

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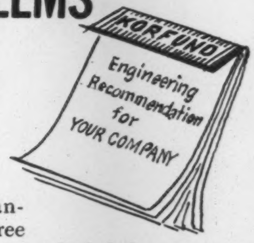
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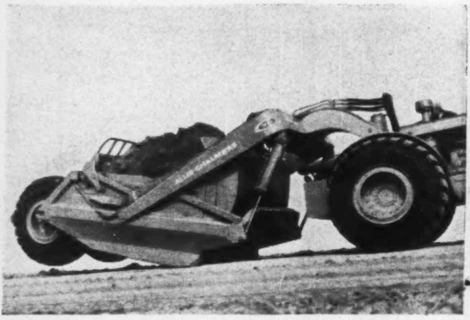

Double-acting bowl jacks put enough penetrating force on the cutting edge to pivot the *scraper and its load* clear of the ground.

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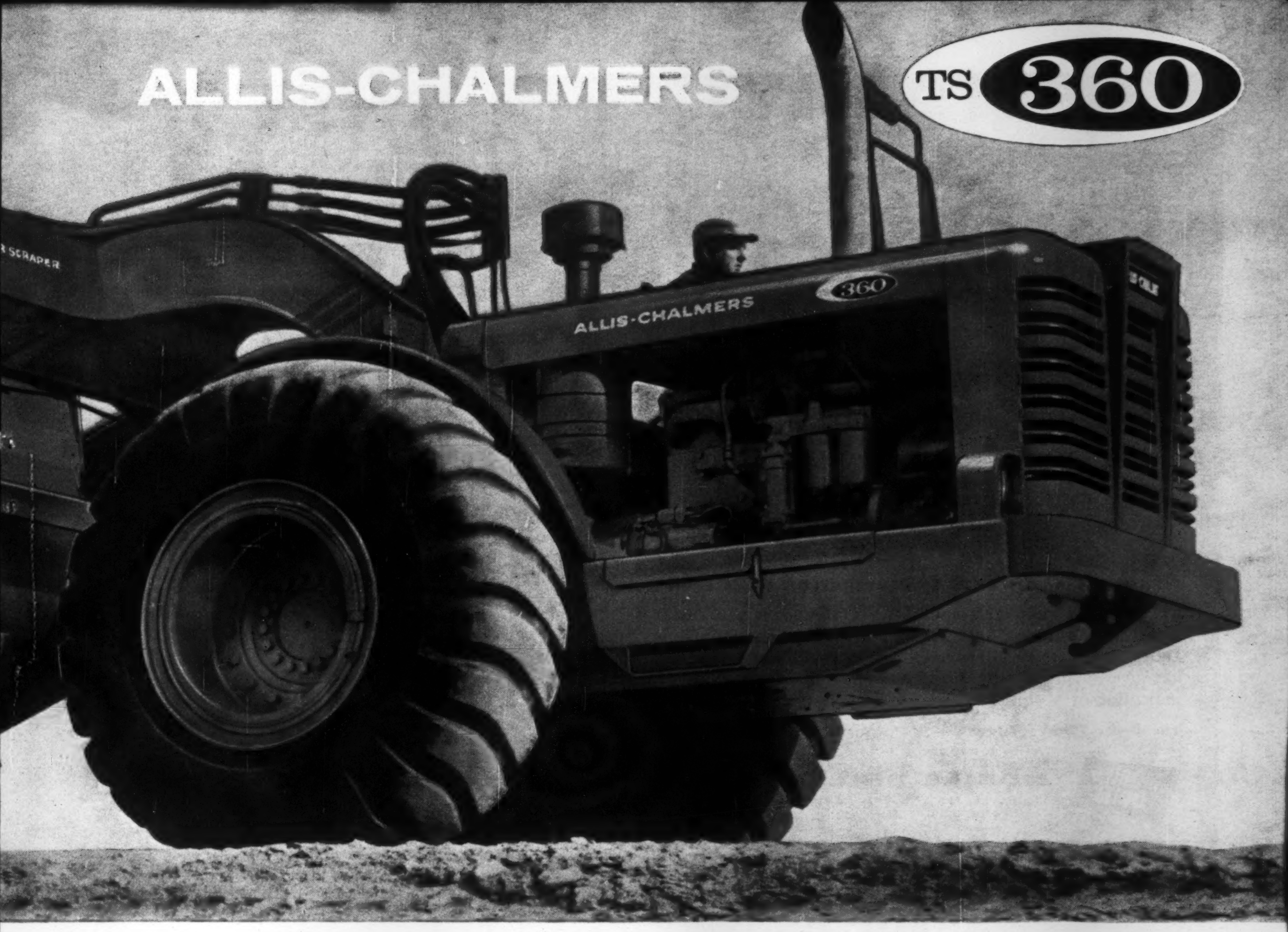

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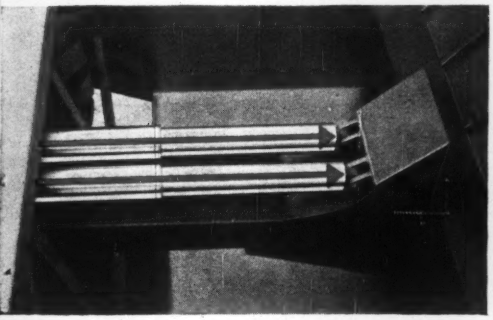
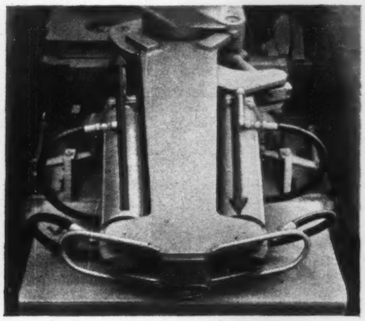


Twin telescoping cylinders provide smooth, forced ejection of any material . . . without "pumping" tailgate.



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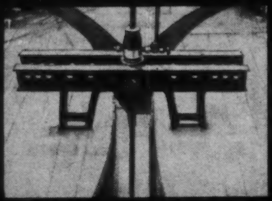
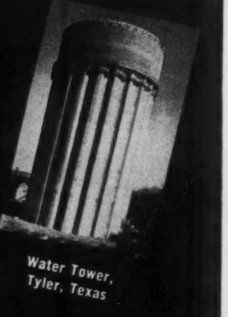


All-inclusive compact jacking unit



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(Continued from page 181)

HEAVY CONSTRUCTION—LB & CA

▲ **George M. Brewster & Son, Inc.**, 275 W. Fort Lee Rd., Bogota, N. J., LB **$3,966,193,** (9 bidders), George Washington Bridge lower level expansion, Phase 5, Contr. GWB-190.028, NEW YORK and NEW JERSEY. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Jan. 19. CD 1/6.

▲ **Corbetta Constr. Co.**, 220 E. 42nd St., New York, N. Y., CA **$2,344,000,** two berth Pier 6, foot of Atlantic Ave., Brooklyn Port Authority Piers, Contr. BP 190.002, BROOKLYN, N. Y. Port of New York Authority, 111 8th Ave., New York 11, N. Y. Bids Dec. 29. CD 1/15, under LB.

▲ **PENNSYLVANIA**—State Hys. Dpt., 506 North Office Bldg., Harrisburg, Bids opened 1/15,

Pa.—**Latrobe Rd. Constr., Inc.**, Box 150, Latrobe, Pa., LB **$1,437,270,** (15 bidders), 16,114 ft. cr. aggregate base with bit. surf. 24 ft. wide, T.R. 59, Kinzua Twp., Warren Co.;

Pa.—**L. M. Hutchison**, R.D. Mount Union, Pa. LB **$204,073,** (9 bidders), 12,431 ft. cr. aggregate base highway with bit. surf. 18 ft. wide, and 1 alternate superstructure bridge, L.R. 41044 (6) Eldred Twp., Lycoming Co. CD 12/29.

BUILDINGS—LB & CA

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 1, N. Y., LB **$2,370,000,** (8 bidders), general contract addn. and modernization of (former Public School 5, Brooklyn) now George Westinghouse VOCATIONAL and TECHNICAL HIGH SCHOOL, BROOKLYN, N. Y. Supt. Design, Constr. & Physical Plant, Bureau Constr., 4th Fl., 42-15 Crescent St., Long Island City 1, N. Y. Bids Jan. 19. CD 12/10;

Dierks Heating Co., 43-32 33rd St., Long Island City, N. Y., LB **$538,375,** (9 bidders), heating George Westinghouse Vocational and Technical High School (Brooklyn, N. Y.);

Benjamin Hochman Elec. Co., 121 Willoughby St., Brooklyn 1, N. Y., LB **$678,810,** (14 bidders), electric George Westinghouse Vocational and Technical High School (Brooklyn, N. Y.).

▲ **Diesel Constr. Co.**, 24 W. 58th St., New York 19, N. Y., CA Est. **$3,500,000,** 19 story OFFICE and SHOWROOM, 104-106 W. 40th St. and 107-113 West 39th St. between Broadway and Avenue of the Americas, NEW YORK, N. Y. Aaron Rabinowitz & Arnold T. Milton, 551 Fifth Ave., New York 17, N. Y. Emery Roth & Sons, 400 Park Ave., New York, N. Y., archts. CD 1/20.

▲ **Diesel Constr. Co. Inc.**, 4 West 58th St., New York, N. Y., CA 22 story, glass, aluminum, 733 Third Ave. OFFICE, 3rd Ave. and E. 46th St., NEW YORK, N. Y. Durst Organization, 205 E. 42nd St., New York 1, N. Y. Emery Roth & Sons, 575 Madison Ave., New York, N. Y., archts. James Ruderman, 32 Union Square, New York, N. Y., structural engr. DiGiacomo Assocs., 114 Liberty Ave., New York, N. Y., mechanical engrs. CD 1/23/58.

Drier Structural Steel Co., Inc., 32-50 Vernon Blvd., Long Island City, N. Y., CA Steel for OFFICE, 3rd Ave. and E. 46th St. (New York, N. Y.)

▲ **J. & H. Shapiro**, Beach Haven Park, N. J., Separate Contracts, **$1,275,000,** RESIDENTIAL DEVELOPMENT (150), Beach Haven West, BEACH HAVEN, N. J. Abraham W. Geller, 333 E. 23 St., New York, N. Y., archt.

▲ **W. J. Happel & Co.**, 589 Central Ave., East Orange, N. J., Owner Builds, **$2,000,000,** 90 HOUSES, West Inman Ave., COLONIA, N. J.

▲ **A. E. Minstein Constr. Co.**, 864 Willis Ave., Albertson, New York, N. Y., LB **$1,992,000,** general contract COURT HOUSE renovation, JERSEY CITY, N. J. Bd. Freeholders, Court House, Jersey City, N. J. Bids Dec. 22. CD 11/19.

▲ **Arthur H. Pudula**, 81A Mount Vernon Place, Newark, N. J., Owner Builds, **$3,000,000,** 21 story APARTMENT, Meeker Ave., NEWARK, N. J. Romolo Bottelli, 1878 Springfield Ave., Maplewood, N. J., archt.

▲† **Araco Constr. & Realty Co.**, 918 W. Courtland St., Phila., Pa., CA **$1,155,390,** off-site utilities and site work, Title 8 Housing, McGuire Air Force Base, IFB-11-626-60-2 CH, WRIGHTSTOWN, N. J. Purchasing & Contracting Office, McGuire Air Force Base, Wrightstown, N. J. Bids Oct. 12. **CD 12/1, under** LB.

▲ **Constructors, Inc.**, 1115 Cochran Hill Rd., Pittsburgh 36, Pa., CA **$1,637,350,** general contract SECONDARY SCHOOL for Brookville Area Jt. School Bd., Proj. 812-648, BROOKVILLE, PA. Pa. P. School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. Bids Dec. 15. CD 12/21, under LB.

▲ **Murraybrook Homes, Inc.**, 1244 West Chester Pike, Havertown, Pa., Separate Contracts, **$1,650,000,** RESIDENTIAL DEVELOPMENT (150), HAVERTOWN, PA.

▲ **Joseph R. Farrell, Inc.**, West Conshohocken, Pa., CA **$1,000,000,** HIGH SCHOOL, CONVENT, GYMNASIUM, AUDITORIUM, PHILA., PA. Mount Saint Joseph Academy, Germantown Pike, Chestnut Hill, Phila., Pa. Bids Jan. 12. CD **12/23.**

▲ **Consolidated Vacuum Corp.**, sub **Consolidated Electrodynamics Corp.**, 1775 Mt. Reed Rd., Rochester, N. Y., CA, construction and installing vacuum MELTING FURNACE, PHILA., PA. Heppenstall Co., 4320 Wissahickon Ave., Phila., Pa. Total est. **$1,000,000;** **Heraeus CmbH,** Hanau, Germany, CA supply furnace (Phila., Pa.).

▲ **David Warren Constr. Co.**, 370 Montgomery Ave., Merion, Pa., Separate Contracts, Over **$1,500,000,** RESIDENTIAL DEVELOPMENT, PHILA., PA. Jack Swerman, 405 Market St., Chester, Pa., archt.

▲ **Paul Tishman Co., Inc.**, 21 East 70 St., New York, N. Y., LB **$4,347,786**, general contract Eastern Pennsylvania State SCHOOL and HOSPITAL for mentally retarded children, Bensalem Twp., PHILA., PA. General State Auth., 18th and Herr Sts., Harrisburg, Pa. Bids Jan. 20. CD 11/25;
The Welsbach Corp., 1500 Walnut St., Phila., Pa., LB **$1,387,131**, heating and air conditioning State School and Hospital (Phila., Pa.);
Riggs Distler & Co., Inc., 1518 Walnut St., Phila., Pa., LB **$546,546**, interior plumbing, State School and Hospital (Phila., Pa.);
Alert Electric Co., 248 North Juniper St., Phila., Pa., LB **$866,000**, electrical work, for State School and Hospital (Phila., Pa.).

▲ **Carl M. Freeman**, 7800 Old Georgetown Rd., Bethesda, Md., CA Est. **$1,090,000**, 109 unit APARTMENT, Swann Rd. and Sycamore Lane, SUITLAND, MD. David Isen, 1511 K St. N.W., Wash., D. C. Collins, Krondstadt & Assocs., 7705 Georgia Ave. N.W., Wash., D. C., archts. CD 11/19.

Merando, Inc., 4098 Minnesota Ave. N.E., Wash., D. C., LB **$904,481** (5 bidders), J. Ormond Wilson ELEMENTARY SCHOOL, 660 K St. N.E., WASH., D. C. D. C. Govt. Dpt. Bldgs. & Grounds, 499 Pa. Ave. N.W., Wash., D. C. Bids Jan. 13. CD 12/23.

▲ **Joseph Nebel Co.**, 3408 Wisconsin Ave. N.W., Wash., D. C., LB Est. **$1,000,000**, HOME FOR RETIRED, 5133 Broad Rd. N.W., WASH., D. C. Home for Presbyterian Retired, 1818 Newton St. N.E., Wash., D. C. Bids Jan. 19. CD 12/22.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
February 2 North Carolina

STREETS AND ROADS
February 2 North Carolina

† **Va., Quantico**—AIRFIELD REPAIR—BA 2/10—Area P. Wks. Office, U. S. Naval Weapons Plant, Wash., D. C., repair airfield pavement and drainage system, Maine Corps Air Station, NBy 17220. $500,000-$1,000,000. Extended date. CD 12/24.

BUILDINGS—BA

▲ **S. C., Rock Hill**—SCIENCE—BA 2/17—Winthrop College, science bldg. $1,000,000. Plans deposit $100. Baker & Gill, 609 Chestnut St., Florence, archts. CD 12/17.

HEAVY CONSTRUCTION—LB & CA

▲ **Somerset Constr. Co.**, N. C., CA Est. **$5,000,000**, hydro electric plant, NORTH CAROLINA. Yadkin, Inc., subsidiary of Aluminum Co. of America, Alcoa Bldg., Pittsburgh 19, Pa. Bids Nov. 16. CD 11/11.

Williams Brothers Co., National Bank of Tulsa Bldg., Tulsa, Okla., CA Est. **$945,000**, 21 mi. 30 in. gas line near DeQuincy, Calcasieu Parish, LOUISIANA. Transcontinental Gas Pipe Line Corp., 3100 Travis St., Houston, Tex. CD 12/18/58, under Texas and Louisiana.

BUILDINGS—LB & CA

W. H. **Weaver Constr. Co.**, 214 W. Gaston, Greensboro, N. C., CA **$978,418**, 100-unit HOUSING, LYNCHBURG, VA. Lynchburg Redevelopment & Housing Auth., Hunt and Bath Sts., Lynchburg, Va. J. Everette Fauber, Jr., Allied Arts Bldg., Lynchburg, Va., archt.

† **Ranney Constr. Co.**, 4395 Poplar Level Rd., Louisville 13, Ky., LB **$951,428** (6 bidders), five TANK REPAIR SHOPS, facilities, hard stands, ENG-15-029-60-5, FORT KNOX, KY. U. S. Eng., P.O. Box 59, Louisville 1, Ky. Bids Jan. 14. CD 12/2.

▲ **Jack Durrett**, 8513 Preston Hy., Louisville, Ky., Owner Builds, Approx. **$1,000,000**, SHOPPING CENTER, incl. BOWLING ALLEY, parking, JEFFERSTOWN, KY.

▲† **Tennessee Valley Authority**, 410 Union Ave., Knoxville, Tenn., Own Forces, **$1,000,000**, grading site for STEAM PLANT, PARADISE, KY CD 10/6.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES
February 9, Indiana, Wisconsin
February 17, Michigan

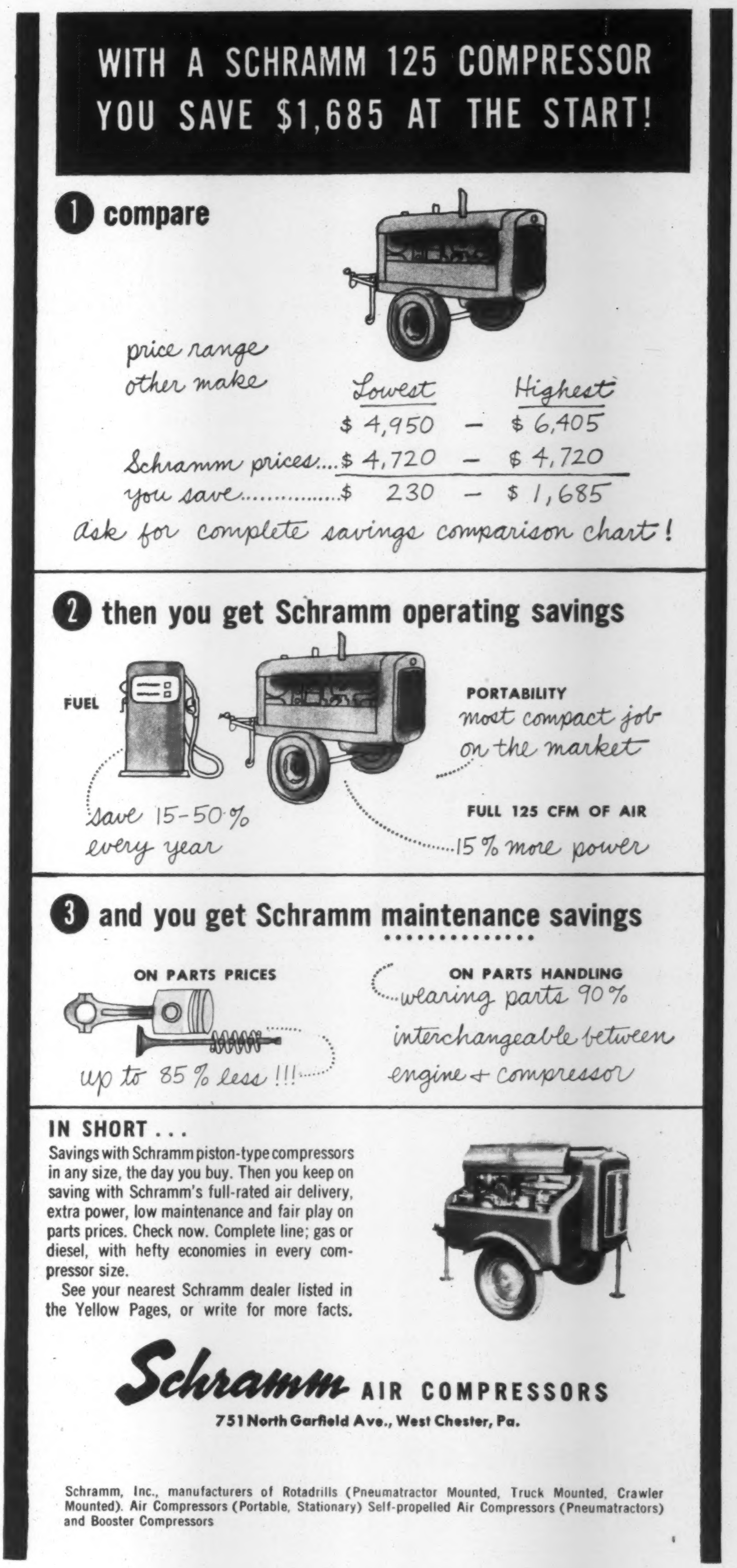
STREETS AND ROADS
February 2 Ohio February 9 Wisconsin
February 10, 11 Michigan

BUILDINGS—BA

▲ **Wis., Madison**—REACTOR LABORATORY—BA 2/24—Bd. Regents, University of Wisconsin, Reactor Laboratory. Plans deposit $50. CD 8/21.

HEAVY CONSTRUCTION—LB & CA

▲ **MICHIGAN**—State Hy. Dpt., Mason Bldg., Lansing, A. Lindberg & Sons, Box 134, Ishpeming, Mich., CA **$1,487,073**, (7 bidders), dual 24 ft. concrete pavt. 4.1 mi. and one bridge US 27 from M-46 northwesterly to Isabella County line, Gratiot Co. Bids Jan. 6, awarded Jan. 19. CD 1/11, under LB.



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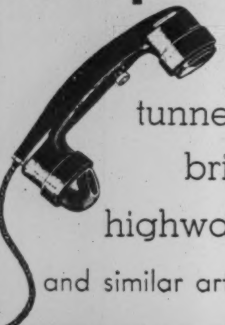

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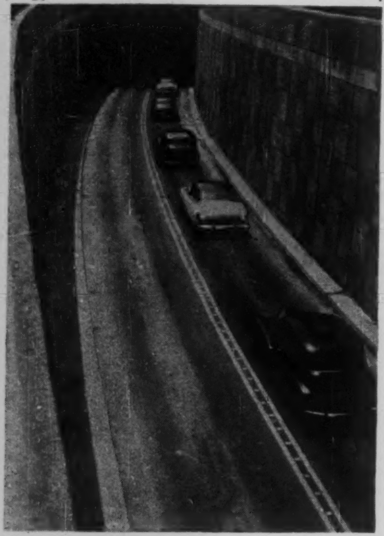

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BUILDINGS—LB & CA

▲ **Freeman Constr. Co.**, R.D. 3, Wooster, O. CA **$2,596,570**, general contract Admiral King HIGH SCHOOL, LORAIN, O. Bd. Educ., 1020 7th St., Lorain, O. Bids Dec. 15, awarded Jan. 14. CD 12/21, under LB.

Phillips Electric Co., 4126 St. Clair, Cleveland, O., CA **$428,225**, electrical contract, Admiral King HIGH SCHOOL (Lorain, O.). CD 11/6.

▲ **Wermuth, Inc.**, 1036 St. Marys St., Fort Wayne, Ind. CA general contract, TRUCK SERVICE PARTS DEPOT, incl. 38,000 sq. ft. office, and 587,000 sq. ft. warehouse, 30-acres, Meyer and Moeller Rds., FORT WAYNE, IND. International Harvester Co., Meyer Rd., Fort Wayne, Ind. Total cost approx. **$1,000,000.**

Gage Structural Steel Div. of Allied Structural Steel Co., 3141 S. Hoyne St., Chicago, Ill., CA, steel contract for truck service parts depot, (Fort Wayne, Ind.).

Alpaco Contractors, Inc., 3819 N. Harlem Ave., Chicago, Ill., Owner Builds, **$950,000**, two 39-unit and two 33-unit APARTMENTS, 6414-34 N. Ridge Ave., CHICAGO, ILL. A. J. DelBianco, 5501 W. Irving Park Rd., Chicago, Ill., archt.

▲ **S. N. Nielsen Co.**, 3059 Augusta Blvd., Chicago, Ill. LB **$9,793,000** (5 bidders), Governor Horner HOUSING EXTENSION, Lake St. and Damen Ave. Proj. 2-35, CHICAGO, ILL. Chicago Housing Authority, 608 S. Dearborn St., Chicago, Ill. Bids Jan. 19. CD 12/11.

▲ **Power Constr. Co.**, 125 S. Marion St., Oak Park, Ill., LB **$2,618,000**, 2 story, 100,000 sq. ft. COLLEGE STUDENT UNION, CHICAGO, ILL. Illinois Institute of Technology, 3300 S. Federal St., Chicago, Ill. Bids Jan. 6. CD 12/24.

▲ **Zinzow Constr. Co.**, 304 N. Brockaway Ave., Palatine, Ill., CA **$2,000,000**, 1 story, 423 x 484 ft. FACTORY and ENGINEERING BLDG., Main St., Crystal Lake Ave. and C. & N.W. R.R., CRYSTAL LAKE, ILL. Oak Mfg. Co., Crystal Lake, Ill. Awarded Jan. 15. CD 12/24.

▲ **Oman & Giden Builders**, 1779 Willow Rd., Northfield, Ill., CA **$1,136,200**, 2 story, 118,000 sq. ft. RIDGWOOD SENIOR HIGH SCHOOL, NORRIDGE, ILL. Norwood Park Twp. High School Dist. 234, 4600 N. Oriole Ave., Norridge, Ill. Bids Dec. 22, awarded Jan. 15. CD 1/15, under LB.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

February 2 Colorado
February 16 Texas
February 18 Nebraska

STREETS AND ROADS

February 2 Colorado
February 5 Kansas
February 16, 17 Texas

▲† **Kansas**—BA 2/11—U.S. Eng., P.O. Box 61, Tulsa, Okla., First Stage, embankment John Redmond Dam near Burlington, Strawn Reservoir, ENG-34-066-60-25. Over $1,000,000. CD 12/16, under LB.

▲† **Kan., Salina**—MISSILE LAUNCH COMPLEXES—BA On Or About 2/24—U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Co., constr. nine missile launch complexes at nine locations: each site will consist of launch control center, launching silo, roads, and utilities, vicinity of Schilling Air Force Base, ENG-23-028-60-46. Over $10,000,000. Plans deposit $100. CD 3/19.

▲† **Neb., Lincoln**—ATLAS MISSILE LAUNCHING SITES—BA About 3/1—U. S. Eng., 1709 Jackson St., Omaha, Zone 2, 9 Atlas Missile launching sites near Lincoln Air Force Base. CD 11/4.

BUILDINGS—BA

▲ **Mo., Hazelwood (St Louis 21 P.O.)**—SCHOOLS—BA 2/16—School Dist. of Hazelwood R-1, Parker Rd. near Old Hall's Ferry Rd., Junior High School addn., Shackleford Rd., elementary school, Humes Lane west of Patterson Rd. $1,000,000. Kenneth E. Wischmeyer, 911 Locust St., St. Louis, Zone 1, archt. Bond election date extended to Mar. 1. CD 1/12.

▲ **Wyo., Laramie**—DORMITORIES—BA 3/3—University of Wyoming, Campus, two 6 story, bsmnt., 400-unit men's dormitories. $3,025,000. Porter & Porter, 1009 E. Lincolnway, Cheyenne, archts. CD 5/13.

BUILDINGS—SLC

▲ **Mo., St. Louis**—PLANT—General Motors Corp., Chevrolet St. Louis Div., 3809 Union Blvd., Zone 15, soon lets contract 3 and 4 story L-shaped, 80x440 ft. and 120x225 ft., brick, steel, concrete automotive plant addn. $1,000,000. Albert Kahn Associated Archtects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., archt. CD 12/24.

HEAVY CONSTRUCTION—LB & CA

▲ **Sheehan Pipeline Constr. Co.**, National Bank Tulsa Bldg., Tulsa, Okla., CA **$2,400,000**, 300 mi. 4, 6 and 8 in. gas gathering lines, in Texas panhandle, Northwest Oklahoma, Southwest Texas and Southeastern New Mexico, TEXAS, NEW MEXICO AND OKLAHOMA. Transwestern Pipeline Co., First City National Bank Bldg., Houston, Tex. CD 11/30.

▲† **Cosmo Constr. Co.**, 7324 Chocolate Bayou Rd., Houston, Tex., CA **$2,840,957**, channel rectification, Brays Bayou, near Houston, ENG-41-243-60-25B, TEXAS. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Dec. 23. CD 1/8, under LB.

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★ Expansion Joints
★ Hoppers and Bunkers
★ Tanks and Vats
★ Pressure Vessels
★ Wind Tunnels
★ Crane Bridge Girders
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▲ **Lee-Emmert,** P.O. Box 305, Richardson, Tex., CA **$1,500,000,** radio and tv station, DALLAS, TEX. A. H. Belo Corp., 3000 Henry St., Dallas, Tex. Bids Dec. 17. CD 12/9.

† **Hill & Moore,** 3000 Jacksboro Hy., Wichita Falls, Tex. **LB $972,171, Base Bid on Part No. 1, rehabilitating** 612 Wherry Housing Units outside utilities, air conditioning, Sheppard Air Force Base, ENG-41-612-60-1, WICHITA FALLS, TEX. Procurement Office, Sheppard Air Force Base, Wichita Falls, Tex. Bids Jan. 6. CD 12/16;
R. M. Wells Co., P.O. Box 388, Quanah, Tex. LB **$488,477,** Base Bid on Part 2, rehabilitating 612 Wherry Housing units, outside utilities, no air conditioning, Sheppard Air Force Base, Inv. No. 41-612-60-1 (Wichita Falls, Tex.).

▲ **COLORADO** — State Hy. Dpt., 4201 East Arkansas, Denver,
Herren-Strong Constr. Co., Platteville, Colo., CA **$1,164,-053,** est. $1,240,000, (10 bidders), grading, structures, 10.237 mi. Colorado Project No. I-808-1 (17) 31, Hudson and Roggen, Weld Co. Bids Jan. 19. CD 1/11.

BUILDINGS—LB & CA

Standard Constr. Co., 212 South 6th St., Minneapolis, Minn., CA **$949,750,** CLASSROOMS, GYMNASIUM and DORMITORY, ST. JOSEPH, MINN. College of St. Benedict, St. Joseph, Minn. Bids Jan. 5. CD 1/13, under LB.

▲ **Harvey Constr. Co.,** 1036 Middle Rd., Bettendorf, Iowa, CA Est. **$1,600,000,** Fairlane APARTMENTS, incl. 26 bldgs. for 134 families, Middle Rd., BETTENDORF, IOWA. William R. Harvey, 1036 Middle Rd., Bettendorf, Iowa. Gerald B. Cox, Bettendorf, Iowa, archt.

▲ **S. R. Brunn Constr. Co.,** 3500 Rainbow Blvd., Kansas City, Kan., CA **$1,092,000,** est. $1,000,000, (10 bidders), 2 story brick, stone, steel, rein.-con. X-shaped STUDENT UNION, HHPA Proj. No. Mo. 23 CH 19(s), KANSAS CITY, MO. University of Kansas City, Bd. Trustees, Kansas City, Mo. Hardy & Schumacher, Scarritt Bldg., Kansas City, Mo., archts. J. R. De-Rigne & Assocs., 561 Westport Rd., Kansas City, Mo., mechanical engrs. Burgwin & Martin, 559 Westport Rd., Kansas City, Mo., structural engrs. CD 12/20/56.

▲ **Missouri Bd. P. Bldgs.,** 100 State Capitol, Jefferson City, Mo., rejected bids Jan. 19, MEDIUM SECURITY PRISON, incl. twin 2 story dormitories, chapel, auditorium and recreation center, vocational and industrial shops, educational center, power house, warden's residence and five residences for personnel, MOBERLY, MO. **$8,000,000.** CD 12/22.

▲ **Builders Constr. Co.,** Republic Bldg., Oklahoma City, Okla., CA **$998,500,** est. $900,000, NORTHEAST HIGH SCHOOL addn., OKLAHOMA CITY, OKLA. Bd. Educ., 900 N. Klein St., Oklahoma City, Okla. Bids Dec. 17, awarded Jan. 14. CD 12/24, under LB;
Tankersley Constr. Co., First National Bldg., Oklahoma City, Okla., CA **$1,115,092,** THOMAS JEFFERSON JUNIOR HIGH SCHOOL, SW 59th and Blackwelder Sts. (Oklahoma City, Okla.).

▲ **Tex-Craft Builders, Inc.,** 4904 Travis St., Houston, Tex., CA Approx. **$2,125,000,** 200-room MOTOR HOTEL; CA Approx. **$105,000,** MOTEL AREA and AUTO CENTER hard-type paving, HOUSTON, TEX. John N. Blaffer, c/o Texas National Bank Bldg., Houston, Tex. Frank Sampson & Associates, c/o owner, archts. Ramada Inns Hotels, lessee. CD 1/20.

▲ **Hubbard Constr. Co.,** 1507 Delano St., Houston, Tex., CA **$1,553,210,** Oates Jr. HIGH SCHOOL, HOUSTON, TEX. Houston Independent School Dist., 1300 Capitol Ave., Houston, Tex. CD 1/12, under LB.

▲ **Stresdek Bldg., Inc.,** P.O. Box 14534, Houston 21, Tex., CA **$1,000,000,** SHOPPING CENTER, PASADENA, TEX. Red Bluff Village, c/o C. Pat Lumpkin, S. Moody and Miles F. Wortham, 4316 Dupont St., Houston, Tex. Miles F. Wortham & Assocs., 12 Chelsea Pl., Houston, Tex., archts. CD 8/31.

▲ **James R. Howell & Co.,** 1030 West 6 Ave., Denver, Colo., CA **$1,200,000,** 450 car multi-level PARKING STRUCTURE and remodeling present bldg., DENVER, COLO. Republic Building Corp., 1624 Tremont Place, Denver, Colo.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
February 9 Washington
STREETS AND ROADS
February 9, 16 Idaho February 17, 18 California

▲† **Idaho, Mountain Home**—MISSILE BASE ROADS and BUILDINGS—BA 2/9—U.S. Eng., City-County Airport, Walla Walla, Wash., b. conc. paving 9 mi. access road, 1 story, 19,000 sq. ft., masonry, rein.-con. structures, utilities, etc. Titan Missile Bases, near Mountain Home Air Force Base, ENG-45-164-60-22, $3,000,000. Plans deposit $15. Extended date. CD 12/22.

BUILDINGS—LB & CA

Calif., Compton—SCHOOL—BA 2/5—Compton High School Dist., 417 W. Alondra Blvd., concrete, steel Centennial High School addn., 2606 N. Central Ave. $950,000. Austin, Field & Fry, 1123 W. 3rd St., Los Angeles, archts. CD 10/5, under LB.

▲ **Wash., Pullman**—ENGINEERING—BA 2/16—Washington State University, engineering addn. to Technology Bldg. $1,800,000. Culler, Gale, Martell, Norrie & Davis, Realty Bldg., Spokane, archts. CD 9/18.

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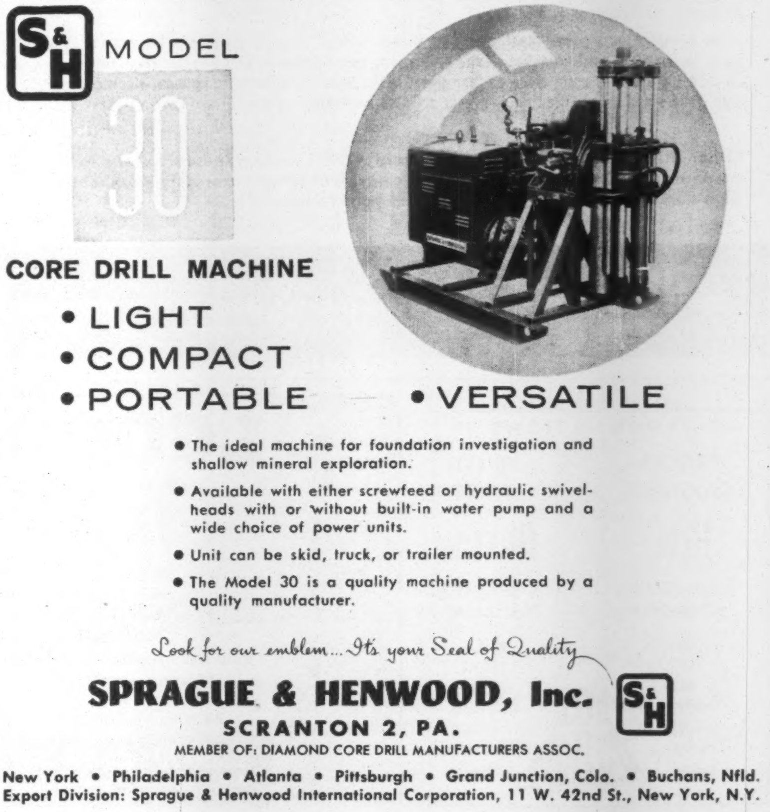
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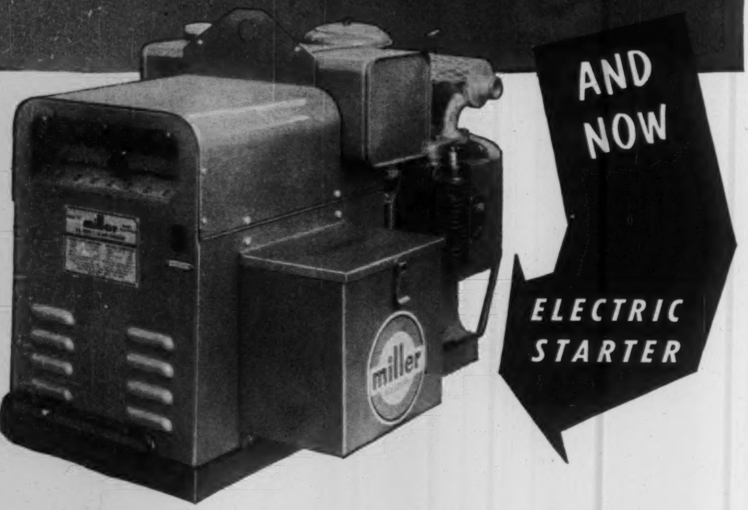

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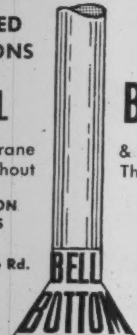

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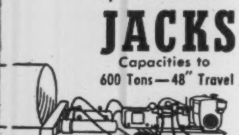

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HEAVY CONSTRUCTION—LB & CA

▲† **Peter Kiewit Sons' Co.**, 345 Kieways Ave., Arcadia, Calif., CA **$2,183,554**, est. $2,342,768, earthwork, concrete lining and structures, Wellton-Mohawk main conveyance channel, Station 0-23.31 to 1176-65 BK, Gila Project, Spec. DC 5256, Yuma Co., ARIZONA, Bureau Reclamation, Dpt. Interior, Yuma, Ariz. Bids Dec. 15, awarded Jan. 14. CD 12/21, under LB.

▲ **WASHINGTON**—State Hy. Comm., Olympia,
Erickson Paving Co., 14446 Sunset Hy., Bellevue, Wash., CA **$1,401,680**, grading, access tunnel and ramp on 1.203 mi. Primary St. Hy. 1, Seattle Freeway, E. 40 St. to Ravenna Blvd., King Co. Bids Jan. 12, awarded Jan. 13. CD 1/14, under LB.

▲† **D. Gerald Bing & John B. Sooy Constr. Co.**, Box 237, Adelanto, Calif., CA **$1,590,000**, Part U, aircraft parking apron (3rd Increment), Naval Air Station, IFB NBy 25184, LEMOORE, CALIF. Dist. P. Wks. Office, 12th Naval Dist., Rm. C112, San Bruno, Calif. Bids Dec. 23. CD 12/3.

▲ **Ukropina-Polich-Kral & John R. Ukropina**, 201 E. Las Tunas Dr., San Gabriel, Calif., CA **$1,688,918**, est. $1,500,000, East Orange County feeder pipe line, Spec. 578, LOS ANGELES, CALIF. Metropolitan Water Dist. of Southern Calif., 306 W. 3rd St., Los Angeles, Calif. Bids Jan. 7, awarded Jan. 12. CD 12/30.

BUILDINGS—LB & CA

▲† **H. S. Wright Constr. Co.**, 414 Pontius St., Seattle, Wash., LB **$3,036,934**, (9 bidders), CENTURY 21 COLISEUM, SEATTLE, WASH. State Dpt. Commerce & Economic Development, 312 1 Ave. N., Seattle, Wash. Bids Jan. 19. CD 12/9.

Marjan Dev. Co., 9562 Ball Rd., Anaheim, Calif., CA **$914,500**, 78 stucco DWELLINGS, Tract 3392, ANAHEIM, CALIF. Ponce De Leon, Inc., Box 2248, Anaheim, Calif.

▲ **Scientific Design, Inc.**, 2 Park Ave., New York 16, N. Y., CA design and construct POLYVINYL CHLORIDE PLANT, WATSON, CALIF. B. F. Goodrich Chemical Co. (sub. B. F. Goodrich Co.), 3135 Euclid Ave. Cleveland 15, O.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **McNamara Constr. of Newfoundland Ltd.**, Alexander St., St. Johns, Newfoundland, CA **$3,802,375**, main terminal pier, Marginal Wharf, St. Johns Harbor redevelopment project, ST JOHNS, NEWFOUNDLAND. Dpt. P. Wks., 404 Hunter Bldg., Ottawa, Ont. Bids Nov. 18, awarded Jan. 15. CD 11/27, under LB.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto,
Simkins Constr. Co. Ltd., Andrews and Jarvis Sts., Winnipeg, Man., CA **$1,069,124**, grading, culverts, granular base 9.57 mi. Trans-Canada Hy. 17 from 10 mi. east of Longbow Corners easterly (Contract 59-131) Longbow Corners. Bids Jan. 13, awarded Jan. 18. CD 1/19, under LB.

▲ **Mannix & Assocs.**, 737 8th Ave. SW, Calgary, Alta. CA **$14,700,000**, dam and power canal hydro-electric project, Saskatchewan River, Squaw Rapids, SASKATCHEWAN. Saskatchewan Power Corp., 1739 Cornwall St., Regina, Sask. Bids Jan. 5. CD 12/29.

BUILDINGS—LB & CA

▲ **Michael Court Apartments (Ivanhoe Investments Ltd.)**, 195 Montclair Ave., Toronto, Ont., Owner Builds **$1,245,100**, two 8 story APARTMENTS, 515 and 525 Chaplin Cres., TORONTO, ONT. E. I. Richmond, 455 Spadina Ave., Toronto, Ont., archt.

Lionel Belanger & Fils, Inc., 351 Rang St. Michel, Ste. Therese de Liseux, Que., CA **$872,000**, 3 story, rein.-con., brick SECONDARY SCHOOL, concrete fdn., 76th St. W., CHARLESBOURG, QUE. Catholic School Comn. of Charlesbourg, Charlesbourg, Que. CD 12/2, under LB.

▲ **Raymond Lecompte Constr. Inc.**, 36 Ave., des Erables, Valleyfield, Que., LB **$1,080,000** (2 bidders), 3 story, 64x321 ft. SCHOOL, VALLEYFIELD, QUE. School Comn. of Valleyfield, Valleyfield, Que. Bids Jan. 12. CD 1/6.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲† **HONDURAS**—Bureau P. Rds., Dpt. Commerce, Inter-America Hy. Div., 18th and F Sts. N.W., Wash., D. C., U.S.A.
Johnson, Drake & Piper, 2444 W. Holcombe Blvd., Houston, Tex., CA **$2,197,850**, Inter-American Highway, El Savador Border-Nicaragua Border, Honduras Proj. 56-1(B). Bids Dec. 15. CD 12/17, under LB.

BUILDINGS—LB & CA

▲ **Alvaro Palenga**, Agraciada 1513 D.1, Montevideo, Uruguay, CA Est. **$3,000,000**, HOTEL, PUNTA DEL ESTE, URUGUAY. Ferretti Sudamericana S.A. 25 de Mayo, 683, Montevideo, Uruguay. J. Jones Odriozolo, F. Villegas Berro, H. Vignale Peirano (Arq. Asociado), 25 de Mayo 683, Montevideo, Uruguay, archts.-engrs. Awarded Jan. 7.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Iran, Hamadan**—AIR BASE—BA 3/16—Govt. of Iran, Tehran, air base. CD 1/12.

HEAVY CONSTRUCTION—LB & CA

▲ **National Iron Ore Co. with Liberia Mining Co.**, Monrovia, Liberia (Associated Mines Service and Mine Management Associates, Ltd., 70 Pine St., New York 5, N. Y., U.S.A., agents), Owner Builds, 52 mi. railroad from Mano Hills to Bomi Hills, LIBERIA, AFRICA.

(Proposal Advertisements see pp. 194 to 196)

Ike Expects Dip in Housing Starts

- **The Economic Report to Congress points to the general boom as a major factor.**
- **That's because a booming economy means tight money; and tight money means fewer starts.**

Administration policy makers believe new housing starts are beginning another downward cycle along a pattern made familiar in recent years. If the pattern is followed, this is a year for starts to decline (see p. 46). Another decline would follow in 1961, then a recovery.

Tight money, of course, is the reason for the Administration forecast, not a decline in demand. Officials expect housing construction to play its usual role: Declining when business in general booms; not expanding again until the rest of the economy slacks off.

President Eisenhower's annual Economic Report to Congress makes several comparisons between 1959 and 1955 as years that occupy similar places in the business cycle. For the economy as a whole, both were years of strong recovery following a recession. A comparison of housing in the two years shows what officials have in mind.

In 1955, private housing starts rose to 1,309,500, the climax to a four-year climb. Then they dropped. In 1959, private starts rose to an estimated 1,341,500 after three years of hovering close to the one-million mark.

If the experience of 1955 is repeated, starts will now decline as long as the general business boom continues and authorities keep credit conditions tight. Mr. Eisenhower, on the word of his Council of Economic Advisors, told Congress the boom will almost certainly continue through 1960 and may well extend through 1961. If it does, the trend for housing starts in the next two years seems likely to be down.

The President did not go into 1961 in detail, but his Economic Report flatly predicted a drop in housing during the coming year.

"Expenditures for residential construction . . . are not likely to be as high as in 1959," he told Congress. "However, the extent of the decline should be limited and activity in this sector should exceed that of most recent years." The advisors believe that starts will not drop below a million, and probably will be well above that mark.

The report expresses satisfaction over the performance of residential construction last year, and over the long-run outlook.

The report says that despite a general tightening of credit, housing got a big share. The amount of nonfarm residential mortgage credit in use rose by $15 billion during the year, the greatest single-year advance recorded. The previous high was in 1958, when an increase of $12 billion was scored.

The cost to borrowers was high, however. The Council of Economic Advisors estimates that the yield on home mortgages purchased by the Federal National Mortgage Association (Fannie Mae) in the secondary market rose from around 5.6% in 1958 to 6.3% in 1959. All borrowing costs went up at the same time: The rate on 13-week Treasury bills increased from 2.7% to 4.5%; on prime loans by commercial banks from 4% to 5%; and on Aaa-rated corporate bonds from 4.1% to 4.6%.

The council takes a confident look forward to what the economy as a whole will be like in 1970. It believes the growth rate, as measured by the Gross National Product, will increase from the average of 3.2% since World War II to an average of 4.2% in the decade ahead. By 1969, this faster pace would produce goods and services valued at $725-billion, compared to the $510 billion expected this year.

In the case of housing, the council indulges in an even longer look ahead—all the way to 1980. It projects population growth and marriage rates to estimate the number of new households requiring shelter.

In the most conservative of four separate projections, a 35% increase in households is indicated by 1980. In the most optimistic projection, the increase is 45%.

"Since most of the increase will arise in husband-wife households, the requirements for family dwelling units will grow correspondingly," the President told Congress. "From this will stem the related demands for household equipment and furnishings and a wide range of related items."

The pace of the rise will be an accelerating one, as the council sees it. Between now and 1965, under the most optimistic projection, households will increase 5.1 million. Between 1965 and 1970, the expected rise is 5.4 million. The biggest jump is foreseen for the 1970-75 period, with a 6.1-million gain. The next five-year period is down for a 6.7-million gain.

The possibility of error inherent in such projections increases as they are pushed further out into the future. Up to the later 1970s, however, the council feels the projections are fairly reliable, as they involve persons now living. Sometime before 1980 the number of household formations also will be influenced by the birth rate of the next several years, which adds to the statistical hazards.

The long-run outlook for housing demand is one of the basic reasons why the Administration views the future growth of the economy with confidence.

The decline it sees this year and possibly next is regarded as healthy for the economy as a whole.

North American Aviation Expands A-Power Role

North American Aviation Co., Los Angeles, plans to bite deeper into the foreign market for atomic power.

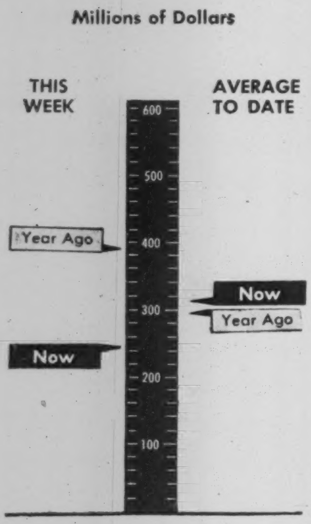
Atomics International, jointly owned by North American, the Societe Alsacienne de Constructions Mechaniques, and Chantiers de L'Antique, propose the formation of a Franco-American company that would build power and research reactors. Emphasis would be on sodium graphite and organic cooled-power types and also solution-type research reactors.

The first project of the new company—Dynatom—would be construction of an organic moderator reactor plant of 165,000-kw electrical capacity for Societe Franco-Belge de la Centrale Nucleaire des Ardennes. The plant, planned for Chooz, France, would be built under the Euratom program.

Atomics International would provide Dynatom with technical assistance, including training of personnel.

Construction Scoreboard

CONTRACTS . . .



AMOUNT OF CONTRACTS LET

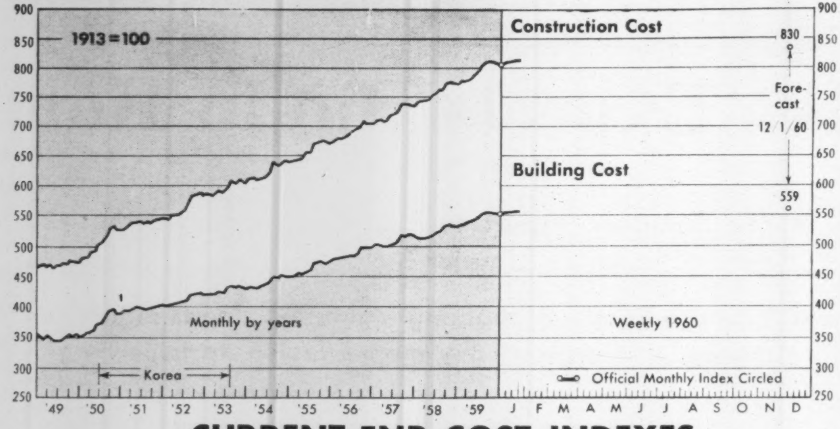
	This Week	Cum. 4 wks= 1960	Chge '59-'60
	millions		%
All Heavy Constr.	$245.2	$1,265.1	+ 3
By Ownership			
PRIVATE	139.9	670.5	+48
PUBLIC	105.3	594.6	−23
State & Municipal	81.9	418.7	−21
Federal	23.4	175.9	−27
By Type of Work			
PUBLIC			
Waterworks	5.3	20.0	−24
Sewerage	10.2	46.2	− 1
Bridges*	5.8	44.9	−21
Highways	28.2	154.8	−21
Earthwork, Dams & Waterways	7.7	56.9	+25
Buildings:			
Excl. Housing	29.8	103.3	−51
Housing	5.2	51.1	+19
Unclassified	13.2	117.9	−19
PRIVATE			
Buildings:			
Mass Housing	52.9	258.4	+67
Commercial	33.0	173.6	+13
Industrial	39.5	195.0	+67
Unclassified	14.4	43.0	+46

*Includes private bridges
=Revised to include Alaska and Hawaii

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

CAPITAL . . .

New Capital For Construction	Week of Jan. 21	Cum. 3 wks 1960	Chge '59-'60
	millions		%
Corporate Securities	$3.0	$53.0	−47
State and Municipal:			
All Except Housing	206.8	586.1	+107
Housing	....	55.0	....
Federal Loans	....	1.6	−61
Federal Aid	....	....	....
Total Nonfederal	$209.8	$641.2	+66
Federal Appropriations:			
Projects in U.S.	....	....	....
Outside U.S.	....	....	....
Total New Capital	$209.8	$641.2	+66



CURRENT ENR COST INDEXES

ENR INDEXES (1913=100), 20-cities' average	Week of Jan. 21 1960	% Change from Dec. 24 1958	% Change from Jan. 22 1958
Construction Cost	813.19	+0.49	+4.46
Building Cost	555.69	+0.42	+3.50

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	December 1959 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$117,142	+0.4	+2.6
By Ownership—			
Private	51,044	+0.8	+3.1
State & Municipal	51,747	+0.4	+2.3
Federal	14,350	−1.0	+1.9
By Type of Work—			
Waterworks	2,822	+0.4	+6.1
Sewerage	3,808	+0.6	+6.5
Bridges	3,439	+0.7	+3.1
Highways	12,870	+0.2	+1.4
Earthwork, Dams and Waterways	12,068	−0.3	−0.4
Public Buildings	21,870	+0.3	+2.8
Industrial Buildings	17,117	+0.6	+0.2
Commercial Buildings	23,262	+0.8	+3.9
Unclassified, Private	10,666*	+1.2	+6.3
Unclassified, Public	9,852	−0.5	+2.5

* Includes private bridges $90.7 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1959 Dec.	1959 12-months	Percent Change from '58 Dec.	Percent Change from '58 Year Cum.
	(millions)			
Total U. S. (ENR reported)	$1,793	$20,280	+11.3	+21.8
By ownership—				
Private	1,126	10,326	+10.5	+40.4
State & Municipal	616	7,453	+16.5	+ 5.7
Federal	51	2,501	−19.0	+11.3
By Type of Work—				
Waterworks	27	530	−39.6	+ 4.0
Sewerage	65	773	+170.9	+ 5.3
Bridges	41	447	+1,905.1	+ 8.4
Highways	104	1,718	+94.2	− 3.3
Earthwork, Dams and Waterways	17	844	−59.8	+24.5
Public Buildings	329	4,219	−12.5	+ 3.9
Industrial Buildings	327	3,226	−33.6	+84.5
Commercial: Mass Housing	360	3,317	+96.8	+49.8
Other Building	244	2,689	+14.6	− 6.5
Unclassified, Private	195†	1,094‡	+49.5	+113.0
Unclassified, Public	84	1,423	+76.3	+26.5

† Includes private bridges $1.9 million.
‡ Includes private bridges $11.1 million.

FLOW OF PROJECTS OUT OF THE BACKLOG INTO CONTRACTS

	1959 Dec.	1959 12-months	Percent Change from '58 Dec.	Percent Change from '58 Year Cum.
Total U. S. (ENR reported)	$873	$10,304	+10.2	+ 1.2
By Ownership—				
Private	407	4,004	+66.9	+43.5
State and Municipal	294	4,362	−32.7	−22.1
Federal	171	1,937	+55.1	+ 8.2

Court Questions Brown-Olds

Third Circuit says labor board cannot impose penalty in cases where there's no evidence of union coercion

The National Labor Relations Board must be more selective in its use and application of the Brown-Olds reimbursement remedy if it is going to make it stick in the construction industry.

The warning comes from the Third Circuit Court of Appeals, which has set aside the board's use of the penalty in a case involving American Dredging Co. and a local of the operating engineers union.

It was the court's conclusion that the board exceeded its power in using the remedy because its use served none of the purposes of the law.

The penalty, which the construction industry is questioning on both the legislative and judicial fronts, is part of the Mountain-Pacific package designed by the board two years ago in an attempt to stamp out closed-shop practices in the construction industry. It requires contractors and unions caught in an illegal hiring practice that gives preference to union members to return to the workers all union fees, dues and assessments collected during the existence of the illegal hiring arrangement.

Use of the remedy is hard to upset because the board has been given relative autonomy with respect to its enforcement orders. The Supreme Court has ruled in the past that courts should not upset the orders as long as they "effectuate the purposes of the Act."

The board has continued to justify its use of the Brown-Olds remedy on the ground that it delivers enough of a punch to make unions and contractors afraid to violate the law. In this sense, the board argues, it does promote the purposes of the law.

The appeals court, however, uses the situation that developed in the American Dredging case to show the fallacy of the argument.

The case involved discrimination in employment by hiring only union members. There was no evidence that any employee was required to join the union in order to get a job with the company. The workers were all union members to begin with.

In view of these circumstances, the court said, "We cannot perceive how reimbursing employees . . . for initiation fees, dues and other monies paid to the union could in any way effectuate the policies of the Act. This case involves preferment of union members for employment, and thus it is incomprehensible to us how reimbursing them . . .. can be anything but a windfall to the employees and an unjust penalty to the employer. This was certainly no purpose of the National Labor Relations Act."

The court also felt that the remedy was too general in nature to be enforceable.

Here, the court's objection was twofold: The board's order in the blanket form it now takes does not indicate what money should be returned to what workers. And it fails to make a distinction between workers who are forced to join a union to get a job and those who join for other reasons.

Implication of the ruling is that the Brown-Olds remedy, when used, should relate only to those payments received from workers who are required to pay a union to get a specific job. This would be a much less stringent penalty than the present one.

The decision is the first authoritative questioning of a board practice that has disturbed and alarmed the entire industry. And it gives employers and unions some new ammunition with which to fight the practice in the courts and halls of Congress.

Training Set Up for Surveyors

Labor and management in southern California have established an apprenticeship program for the various branches of surveying.

On-the-job training has already begun. First classes in related academic instruction begin March 1.

The program was developed by the California Council of Civil Engineers and Land Surveyors, Los Angeles Chapter, and the International Union of Operating Engineers, AFL-CIO, Local 12D. It is believed by its sponsors to be the first of its kind in the West.

Apprentices will be trained under the program in any (but only one) of eight phases of surveying: land survey, subdivision, topographic, triangulation, construction, hydrographic, railroad and mineral. It will take an apprentice about four years to work his way up through the five grades from probationary apprentice to party chief.

Groundwork for the program was laid in the 1958-59 master labor agreement between the council and the OE. The contract provided for a joint committee to explore the possibility of such a program to help relieve the shortage of trained surveyors in the Los Angeles area.

The California Division of Apprentice Standards worked with the joint committee in developing the program.

Labor in Brief . . .

- **Wages equalized** – Construction laborers in three northern New York counties have been granted basic wage increases totaling 25 cents an hour, payable in two installments, in a 29-month contract. Laborers in a fourth county won 32½ cents in the same contract to equalize their wages with the others.

- **Union sued for damages**–Fibreboard Paper Products Corp., which has contracted out its maintenance work to Fluor Maintenance, Inc. (ENR Dec. 17, 1959, p. 239) has sued a steelworkers local union–the one that lost the maintenance work and that subsequently struck the plant–for $1,358,000, half for operating losses and half for punitive damages.

- **Clamps down on picketing**–Relying on the new Landrum-Griffin restrictions on picketing, the National Labor Relations Board filed a petition to restrain a building trades council in Rhode Island from further picketing of a nonunion contractor in East Providence. Law prohibits organizational picketing for more than 30 days unless an election petition has been filed.

- **Teamster goals**–Asserting that teamsters "will play an active legislative role" in the present session of Congress, James Hoffa says union goals include a stronger Davis-Bacon Act and improvements in the federal highway program. Union will push for constitutional safeguards in congressional investigations.

OFFICIAL PROPOSALS

Bids: February 18, 1960.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Canal Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A. M., eastern standard time on the 18th day of FEBRUARY 1960, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor. The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany 1; New York						
Essex (Rte. 86)	FARC 60-16	Jay-Lake Placid, Pt. 1, S.H. 5540 Project F-876(5)	1.02	Asph. Conc. Pavt. Plate Gird. Br. 137′ Sp.	$24,000 Plans $5	$424,000
Saratoga	R.C. 60-13	Various State Highways on Rtes. Nos. 67; 147; 50; 29; 9P and 9N	....	Removal of 237 Trees	$600 Plans $5	10,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica 1; New York						
Oneida (Rte. 46)	FARC 60-14	Delta-Westernville, S.H. 1141 Rome-Northwestern, Pt. 1, S.H. 561 Project S-372(2)	4.42	Asph. Conc. Type 1A Prestressed Conc. Comp. Beam 76′ Br. Sp.	$54,000 Plans $5	982,000
DISTRICT No. 3, E. E. Towlson, Acting District Engineer, 333 E. Washington Street; Syracuse; New York						
Cortland (Rte. 11 & 13)	FAC 60-4	City of Cortland: Arterial Highway Tompkins and Port Watson Streets Project U-481(7)	2.35	Asph. Conc. Type 2A Pavt.=2.32 Mi. Misc. Work=0.03 Mi.	$68,000 Plans $5	$1,231,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1; New York						
Monroe	M 60-3	Court St. Dam City of Rochester	....	Clean. and Paint. Sector Gate No. 1	$275 Plans $10	5,000
Monroe (Int. Tour. Rte. 490)	FIC 60-6 FAC 60-9	Interstate Route Conn. 580 Rochester City-Eastern Expressway, Part 1 East City Line Interchange and City of Rochester: Outer Loop Arterial Highway (Highland Ave. to Int. Rte. 580) Project I-1107 (11), U- 1093 (4)	0.94	9″ Cem. Conc. Pavt., 2 @ 50′ Var. Wide=0.94 Mi. (Asph. Conc. Type 1A and Type 2A on Interchange) 4 Hwy. Seps. Comp., I-Beam, 4 Sp. 321.5′, 3 Sp. 143.5′; 4 Sp. 182′, 1 Sp. 62′; 2 R.R. Seps. Comp., I-Beam; 5 Sp. 381.6′ 3 Sp. 135′; 1 Hwy. Sep. Comp. Deck Gird., 2 Sp. 234.4′, 2 R.R. Seps. Thru Pl. Gird., 4 Sp. 352.7′; 1 Sp. 57′	$270,000 Plans $10	$4,876,000
DISTRICT No. 6, J. H. Thomas, District Engineer, 30 West Main St., Hornell; N. Y.						
Steuben (Rte. 248)	FARC 60-15	Canisteo-Whitesville, Pt. 4, S.H. 8104 Canisteo-Whitesville, Pt. 5, S.H. 8204 Project F-367(6)	2.45	Asph. Conc. Pavt.=2.44 Mi.; Misc. Work=0.01 Mi., 3 Comp. Beam Brs., 2 Sp. 100′; 1 Sp. 63.3′; 1 Sp. 75.0′	$42,000	753,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton (Int. Tour. Rte. 87)	FITS 60-1	Interstate Route 502, Sect. 7D-2 Twin Bridge Road-Canadian Border Project I-87-4(16)	1.96 (4.50 Acc.)	Traffic Signs and Delineators	$1,800 Plans $5	33,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Rockland (Rte. 303)	FARC 60-11	New Jersey State Line-Congers Pt. 1, S.H. 1898 New Jersey State Line-Congers Pt. 2, S.H. 8448 Project U-528(8)	1.19 (0.37 Acc.)	9″ Cem. Conc. Pavt. 2 @ 24′ Wide=1.14 Mi.; Misc. Work=0.05 Mi. (Acc.=0.22 Mi. Asph. Conc. Pavt. and 0.15 Mi. Cem. Conc. Pavt.)	$55,000 Plans $5	1,000,000
Westchester	TSP 60-1	Taconic State Parkway: Kitchawan Road Interchange, Northeast Ramp	0.39	8″ Cem. Conc. Pavt.=0.33 Mi. Misc. Work=0.06 Mi.	$7,000 Plans $5	130,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 17C)	FARC 60-17	Lestershire, S.H. 125 Hooper-Johnson City, S.H. 5699 Project U-401(9), U-1143(2)	1.94 (1.96 Acc.)	Asph. Conc. Pavt.=2.33 Mi. Grading and Drainage=1.57 Mi.	$190,000 Plans $5	3,476,000
Delaware, Sullivan, New York & Wayne, Pa.	I, Br. 60-2	Hancock; Lordville, N. Y.-Equimunk, Pa; Kellams Bridge, N. Y.-Stalker, Pa.; Cochecton, N. Y.-Damascus, Pa.; 4 Bridges	....	Clean. and Paint. 5 Bridges, 2 Suspension and 2 Thru Trusses	$1,800 Plans $5	32,500
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Queens	FAHHE 60-1	Horace Harding Expressway, Section 2 (Contract 7) (Oceania Street to Nassau County Line) Project U-862(21)	2.84	Fencing, Guide Railing; Signs; Access Road; Misc. Work	$31,000 Plans $5	575,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN

SUPT. OF PUBLIC WORKS

Bids: February 15, 1960

Furnishing Material & Performing Labor For Constructing an Intercepting Sewer

Notice is hereby given that sealed bids will be received in accordance with the law by the Ewing-Lawrence Sewerage Authority until two o'clock P.M. Eastern Standard Time on the fifteenth day of February, 1960 at the office of the Authority at 600 Whitehead Road, Trenton, New Jersey, for furnishing materials and performing the labor for constructing an intercepting sewer in accordance with the plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York.

Copies of the plans and specifications may be obtained either from the Authority or from the Consulting Engineers at their New York office upon deposit of Twenty ($20.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within twenty (20) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be performed consists of furnishing and installing approximately four thousand two hundred and sixty (4,260′) lineal feet of eight (8″) inch, two thousand five hundred and ninety (2,590′) lineal feet of twelve (12″) inch, two thousand four hundred and eighty-five (2,485′) lineal feet of fifteen (15″) inch and nine thousand and ninety (9,090′) lineal feet of eighteen (18″) inch pipe and appurtenances.

Each proposal must be accompanied by a certified check payable to the Ewing-Lawrence Sewerage Authority or bid bond from a reliable surety company authorized to do business in the State of New Jersey and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

Each proposal must be accompanied by an agreement of a surety company qualified to do business in the State of New Jersey in the amount of such proposal, which agreement shall bind the surety company that if the contract be awarded the bidder it will, upon the contract being awarded, become surety for the faithful performance of said work. Said agreement shall be in writing and in the form of surety guarantee provided. The successful bidder will be required to furnish the statutory performance bond in the amount of his bid, approved as to form by the Authority counsel and as to sufficiency by the Authority.

The project will be financed in part by a grant-in-aid from the United States Government under the provisions of Public Law 660, Water Pollution Control Act Amendments of 1956.

The Authority reserves the right to consider bids for sixty (60) days after their receipt before awarding any contract or for such longer period as may be required to obtain the necessary approval of award by the United States Public Health Service and the right is reserved to accept any bid or to reject any or all of them.

EWING-LAWRENCE SEWERAGE AUTHORITY
Wilfred F. Predhome (Chairman)
Joseph T. Barber (Vice Chairman)
Philip A. Smith (Treasurer)
John G. Brady (Secretary)
John E. Malone
Stephen J. Krol
Buck, Seifert and Jost
Consulting Engineers
Dated: January 18, 1960

Bids: April 2, 1960.

Tender for Construction of Mahaweel New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER AND ELECTRICITY
NOTICE NO. 18

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Mahaweel Hilla Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/—or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Mahaweel Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are available at the Embassy of Iraq, 2135 Wyoming Ave N.W., Washington, D. C. at a cost of $28.00.

DIRECTOR GENERAL
OF WATER & ELECTRICITY.

Bids: April 2, 1960

Tender for Construction of Qara Tappa New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER AND ELECTRICITY.
NOTICE NO. 19

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Qara Tappa, Kirkuk Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Qara Tappa Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are also available at the Embassy of the Republic of Iraq, 2135 Wyoming Ave N. W. Washington, D. C. at a cost of $28.00.

DIRECTOR GENERAL
OF WATER & ELECTRICITY.

Bids: April 2, 1960.

Tender for Construction of Sheikh Sa'ad New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER AND ELECTRICITY
NOTICE NO. 16

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Sheikh Sa'ad Anrah Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/—or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Sheikh Sa'ad Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are available at the Embassy of Iraq. 2135 Wyoming Ave N. W., Washington, D. C., at a cost of $28.00.

DIRECTOR GENERAL
OF WATER & ELECTRICITY.

Bids: March 17, 1960

5-Track Bridge

GRAND TRUNK WESTERN RAILROAD COMPANY

5-Track Bridge to carry the tracks of the Grand Trunk Western Railroad over the proposed Flood Control Channel for the Kalamazoo River, Battle Creek, Michigan.

Sealed proposals for the construction of a Railroad Bridge to carry the tracks of the Grand Trunk Western Railroad over the Flood Control Channel of the Kalamazoo River in Battle Creek, Michigan, will be received by the Grand Trunk Western Railroad, 131 W. Lafayette Street, Detroit 26, Michigan, from bidders until 12:00 o'clock noon on Thursday, March 17, 1960.

Plans, specifications and Form of Tender may be obtained from the office of Mr. C. J. Morris, Chief Engineer, following receipt of $50.00 deposit per set, which deposit will be refunded on request upon return of said plans and specifications in good condition. Proposals shall be submitted, marked as indicated upon the Form of Tender provided and accompanied by a certified check or approved bid bond in the amount of five (5) percent of the bid. The accepted bidder will be required to execute performance and lien bonds and obtain insurance as provided in the contract documents.

The Grand Trunk Western Railroad reserves the right to reject any or all bids.

C. J. Morris
Chief Engineer

District of Columbia—Building Construction—Dept. Bldgs. & Grounds, D. C., January 15, 1960. CONSTRUCTION AND COMPLETION OF REPAIR SHOP AND ENGINE CO. 7, Half St. and "M" St., S.W., Washington, D. C. (INVITATION NO. C-60114-B). Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Pennsylvania Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, February 11, 1960, in Room 424, 499 Penn. Ave., N.W.

Bids: February 18, 1960

The Construction of South Approaches to Lewiston Power Plant

POWER AUTHORITY OF THE STATE OF NEW YORK
NIAGARA POWER PROJECT
ADVERTISEMENT FOR PROPOSALS FROM DEVIL'S HOLE TO LEWISTON POWER PLAN TIN LEWISTON AND NIAGARA FALLS, NIAGARA COUNTY, NEW YORK
SPECIFICATIONS NO. PA-N-23088
NIAGARA CONTRACT N 26

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of the South Approach Road and Lewiston Road from Devil's Hole to Lewiston Power Plant in Lewiston and Niagara Falls, Niagara County, New York, until 11:30 A.M., Eastern Standard Time on the 18th day of February, 1960, at the Authority's Office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of work are:

Estimated:

117,000	cu. yds.	Excavation, unclassified
87,000	cu. yds.	Embankment
29,000	tons	Foundation course crushed rock
35,900	cu. yds.	Concrete—various kinds
640,000	pounds	Reinforcement bars, all kinds
826,000	pounds	Structural steel—various superstructures
100,000	lin. ft.	Concrete curbs
2,140	lin. ft.	Reinforced concrete culvert pipe 12" to 36" dia.

The length of road to be constructed under this contract for the divided South Approach Road is approximately 0.55 miles, and for Lewiston Road (part of which has been constructed by others) is 0.65 miles.

The work shall be completed on or before September 1, 1961.

Plans, Specifications and Proposal Forms for the work may be obtained from the Power Authority of the State of New York, upon application and prepayment of a fee of Ten Dollars ($10.00) per initial set of contract documents, and Five Dollars ($5.00) per set for additional sets, no part of which will be refunded. Plans, Specifications and Proposal Forms for the work will be on file in the Authority's Office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with instructions contained in the Information for Bidders, Guarantee will be required with each bid in an amount not less than 20 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. Chapin
General Manager

PA-N-23038

Bids: February 9, 1960

NOTICE
New Postponed Bid Date: February 9, 1960
Original Bid Date: January 14,* 1960

Feeder Road Program

MINISTRY OF PUBLIC WORKS
REPUBLIC OF EL SALVADOR
BIDS: JANUARY 14,* 1960
NOTICE TO CONTRACTORS

The Ministry of Public Works of the Republic of El Salvador advises that on January 14,* 1960, bids will be received for the construction of a major portion of the proposed Feeder Road Program of the country. The Specifications, Plans and Contract Documents will be for sale in El Salvador on December 9, 1959.

All Contractors interested in taking part in this bidding are requested to obtain the necessary Documents, Plans and Specifications from the Office of the Proveeder Especifico de Obras Publicas, Edificio Morazan, 8ª C. P., San Salvador, El Salvador, C. A. All requests must be accompanied by a certified check in the amount of One Hundred Sixty Dollars which will not be returned.

MINISTRY OF PUBLIC WORKS
REPUBLIC OF EL SALVADOR,
C. A.

*New Postponed Bid Date: February 9, 1960

Bids: Apjril 2, 1960

Tender for Construction of Karmah New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER AND ELECTRICITY
NOTICE NO. 23

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Karmah Ramadi Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/-or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Karmah Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are available at the Embassy of Iraq, 2135 Wyoming Ave., N.W. Washington, D. C., upon payment of $28.00.

DIRECTOR GENERAL OF WATER & ELECTRICITY

Bids: Apjril 2, 1960

Tender for Construction of Penjuween New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER AND ELECTRICITY
NOTICE NO. 21

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Penjuween, Sulaimaniya Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/-or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Penjuween Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are available at the Embassy of Iraq, 2135 Wyoming Avenue N.W., Washington, D.C., on payment of $28.00.

DIRECTOR GENERAL OF WATER & ELECTRICITY

Bids: April 2, 1960

Tender for Construction of Shirkat New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER AND ELECTRICITY
NOTICE NO. 22

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director Genneral of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Shirkat, Mosul Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/—or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Shirkat Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are available at the Embassy of Iraq, 2135 Wyoming Ave. N.W., Washington, D. C., on payment of $28.00.

DIRECTOR GENERAL OF WATER & ELECTRICITY.

MH.
13/12

Bids: See Advertisement

Alterations to Proprietary Fire Alarm System and Public Health Interrogation Booths

THE PORT OF NEW YORK AUTHORITY

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated at which time said proposals will be opened and read in Room 1108.

Contract NYA-110.012—New York International Airport—Alterations to the Proprietary Fire Alarm System—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Tuesday, February 16, 1960.

Contract NYA-110.014—New York International Airport—International Arrival Building—Alterations to Public Health Interrogation Booths—No deposit required—Bids will be received until 2:30 P.M. on Tuesday, February 9, 1960.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman

January 28, 1960

Bids: February 8, 1960

Construction of the Grant-River Interceptor City of Cortland, New York

NOTICE TO BIDDERS

Separate sealed bids for the construction of the Grant-River Interceptor will be received by the City Clerk at the City Hall, Cortland, New York, not later than 4:00 P.M. on February 8, 1960. Bids will be publicly opened and read aloud in the office of the City Clerk, City Hall, Cortland, New York, at 8:00 P.M. on February 8, 1960.

Bids will be received for the installation of approximately 8300 feet of 27" diameter sanitary intercepting sewer starting on River Street near the junction of Port Watson Street and River Street and extending along River Street, along the West Branch of the Tioughnioga River, Rickard Street and Grant Street to Main Street.

The Information for Bidders, Plans and Specifications may be examined at the office of the Superintendent of Public Works, Department of Public Works, Franklin Sreet, Cortland, New York, or at the office of Stearns & Wheler, Civil and Sanitary Engineers, 99 Albany Street, Cazenovia, New York, and copies thereof may be obtained at the said office of the Department of Public Works upon payment of $20.00 for each set. Any bidder upon returning such set in good condition within fifteen (15) days after receipt of bids will be refunded his payment and any non-bidder upon so returning such set will be refunded $10.00.

The City of Cortland reserves the right to waive any informalities in or to reject any or all bids.

Charles G. Houser, City Clerk
Cortland, New York

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

For Throgs Neck Bridge Contract No. TN-10E, Bronx and Queens Approaches Viaduct Roadway Slabs. The bid must be accompanied by a deposit in the amount of $100,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $20.00, which will not be refunded.

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

Bids: February 19, 1960

Marine Terminal-Construction of Substructure City of Pensacola and Pensacola Port Authority Pensacola, Florida

THE CITY OF PENSACOLA

Sealed proposals will be received by the City Manager, of the City of Pensacola, Florida, at his office in the City Hall, until 10:00 AM C.S.T., FEBRUARY 19, 1960 at which time they will be publicly opened and read.

Plans, specifications, and contract documents are open to public inspection at the office of the City Engineer, in Room 300, City Hall, Pensacola, Florida and the office of Fredrick R. Harris, Inc., 144 East 44th Street, New York 17, N. Y. or may be obtained upon deposit of fifty dollars ($50.00).

The full amount of deposit will be returned upon return in good condition of all documents within ten (10) days after the date of opening bids.

Bids must be accompanied by a certified check or bid bond in an amount not less than five percent (5%) of the bid.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of sixty (60) days.

Award will be made to the lowest responsible bidder.

The owner reserves the right to reject all bids and to readvertise.

OLIVER J. SEMMES, JR.
CITY MANAGER

ATTEST:
CHAS. H. WALKER
CITY CLERK-COMPTROLLER

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5274) will be received at San Angelo, Texas, until 10 a.m., Central Standard Time, March 17, 1960, for furnishing labor and materials for Twin Buttes Dam, San Angelo Project, Texas. Location Near San Angelo, Texas in Tom Green County. Principal items are 6,000,000 cu. yds. excavation; 17,500,000 cu. yds. excavation in borrow areas; 19,300,000 cu. yds. fill in dam embankment; 45,000 cu. yds. concrete; and other work. Completion time 1,200 days. For particulars, address Bureau of Reclamation, P. O. Box 271, San Angelo, Texas; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids for installation of central airconditioning at the U.S. Post Office & Annex, 33rd St. & 8th Avenue and the U.S. Post Office, Morgan Annex, 341 Ninth Avenue, New York, N. Y., Project No. 00806, will be received until 2:00 P.M., E.S.T., February 19, 1960, and then publicly opened. Bidding material may be obtained after January 22, 1960, from the Design & Construction Division, 12th fl., west, Public Buildings Service, General Services Administration, 250 Hudson Street, New York 13, N. Y.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5277) will be received at Denver, Colorado, until 2 p.m., Mountain Standard Time, March 15, 1960, for furnishing two (2) 93,500-horsepower, vertical shaft, Francis-type, hydraulic turbines for Clear Creek Powerplant, Central Valley Project, California. Delivery is desired within 660 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Sealed bids for the installation of central airconditioning at the U.S. Post Office (Main), Philadelphia, Pa., will be received until 2:00 P.M., E.S.T., February 18, 1960, and then publicly opened. Bidding material may be obtained from the Regional Office, 12th fl. west, 250 Hudson Street, New York 13, N. Y., or from the Field Office, Design & Construction Division of the Public Buildings Service, Room 902 U.S. Custom House and Appraisers Stores, 2nd & Chestnut Streets, Philadelphia 6, Pa.

OFFICIAL PROPOSAL

RATE $2.40 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Class. Adv. Div.; Engineering News-Record, P. O. Box 12, New York 36, N. Y.

Bids: April 2, 1960.

Tender for Construction of Dour New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL
OF WATER AND ELECTRICITY
NOTICE NO. 15

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Deur, Baghdad, Liwa according to the General Conditions and Specification which can be obtained from the Accounts Section of the said Direcotrate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/—or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Deur Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

The specifications are available at the Embassy of Iraq, 2135 Wyoming Avenue N. W., Washington, D. C., at a cost of $28.00.

DIRECTOR GENERAL
OF WATER & ELECTRICITY.

Bids: April 2, 1960.

Tender for Construction of Muwafaqia New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER
AND ELECTRICITY
NOTICE NO. 14

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the New Water Supply Scheme for Muwafaqia Kut Liwa according to the General Conditions and specification which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/—or (equivalent) for each copy or for two copies.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Secretary of the Purchasing Committee, Ministry of Municipalities, Baghdad, and marked "Tender for Muwafaqia, Water Supply Scheme".

Closing date of Tender—12 Noon on Saturday 2nd April, 1960.

DIRECTOR GENERAL
OF WATER & ELECTRICITY.

Bids: April 2, 1960

Tender for Construction of Mahmoudiyah New Water Supply Scheme

REPUBLIC OF IRAQ
MINISTRY OF MUNICIPALITIES
DIRECTORATE GENERAL OF WATER
AND ELECTRICITY
NOTICE NO. 7

TENDER from constituted qualified engineering firms with experience in Public Works of magnitude are invited by the Director General of Water and Electricity, Ministry of Municipalities, for the supply and erection of the clarifying tanks with mechanically operated sludge scrapers, flocculating tanks, flash mixers, alumina dosing apparatus, horizontal rapid pressure filters, air blowers, gaseous chlorinators with platform weighing scales, two electrically operated low lift pumping units, two electrically operated high lift pumping units switch boards, cables, venturi meter and recorder, a welded steel plate elevated service tanks, electrically operated water level recorder, suction main, pumping mains, pump and filter house building overhead gantry crane, electric lighting, sewage disposal system and all other appendages, connections and ancillary works in the new water supply scheme for Mahmoudiyah, Baghdad Liwa of 790,000 gallons per day capacity according to the General Conditions and Specifications which can be obtained from the Accounts Section of the said Directorate on production of a valid Chamber of Commerce Certificate or from the Embassy of the Republic of Iraq or Legation in foreign countries, on the respective payment of the sum of ID.10/—or (equivalent) for each copy or for two copies. Those tenderers who have already submitted their quotations or have already bought Specification can obtain a copy of same freely.

Tenders should be submitted by registered post in sealed envelopes directly addressed to the Director General of Water and Electricity, Baghdad, and marked "Tender for Mahmoudiyah Water Supply Scheme".

Closing date of tender—12 noon on Saturday 2 April 1960.

Specifications are available at the Embassy of Iraq, 2135 Wyoming Avenue, Washington, D. C., at a cost of $28.00.

DIRECTOR GENERAL OF
WATER AND ELECTRICITY.

Bids: See Advertisement.

Supply and Delivery at Port Stores

IRAQI REPUBLIC
IRAQI PORTS ADMINISTRATION—
BASRAH

Tenders are invited for the supply and delivery at Port Stores Jubailah—Basrah of the following materials:-

	Closing Date	Cost of each Form ID.
1) Tender for the supply of Testing Machines for -Textiles, Dyeing (paint) & Leather	31.1.1960	1/-
2) Tender for the supply of Seven Tractor Lorries each with A Semi-Trailer of pay Load Capacity 15-20 Tons	31.1.1960	1/-
3) Tender for the supply of 15000 yards Green Canvas 72" wide for Tarpaulin	7.2.1960	1/-
4) Tender for the supply of Welding Rods (Electric ARC welding Electrodes)....	7.2.1960	1/-
5) Tender for the supply of Six Steel Sheds single span	21.2.1960	5/000
6) Tender for the supply of six steel shed two span....	28.2.1960	12/500

Forms of Tender and specifications are obtainable from the Iraqi Republic Representatives or from Mudir, Purchasing and Tender, Iraqi Ports Administration-Basrah, during working hours, cost of Tender form will not be refunded.

The Tender should reach the Iraqi Ports Administration, before 13.00 hours of the closing date of each tender mentioned above.

The specifications are also available at the Embassy of the Republic of Iraq, 2135 Wyoming Ave. N. W., Washington, D. C. $2.80 is equal to One Dinar.

V.O. 24.12.1959

OFFICIAL PROPOSALS

Bids: February 15, 1960

Furnishing Materials & Performing Labor For Constructing Gravity Sewers

Notice is hereby given that sealed bids will be received in accordance with the law by the Ewing-Lawrence Sewerage Authority, until two o'clock P.M., Eastern Standard Time on the fifteenth day of February, 1960, at the office of the Authority, 600 Whitehead Road, Trenton, New Jersey, for furnishing materials and performing the labor for constructing eight (8") inch gravity sewers with house connections, all in accordance with plans and specifications prepared by Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York.

Copies of the plans and specifications may be obtained either from the Authority or from the Consulting Engineers upon deposit of Fifteen ($15.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within twenty (20) days after the date on which bids are received or else the entire deposit will be forfeited.

The work to be performed consists of furnishing and installing approximately three thousand one hundred (3,100') lineal feet of eight (8") inch sewer pipe and appurtenances, together with approximately five hundred and eighty (580') lineal feet of six (6") inch sewer pipe and appurtenances for house connections. Each proposal must be accompanied by a certified check payable to the Ewing-Lawrence Sewerage Authority or bid bond from a reliable surety company authorized to do business in the State of New Jersey and satisfactory to the Authority, in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority, or the liability bond will accrue, in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

Each proposal must be accompanied by an agreement of a surety company qualified to do business in the State of New Jersey in the amount of such proposal, which agreement shall bind the surety company that if the contract be awarded the bidder it will, upon the contract being awarded, become surety for the faithful performance of said work. Said agreement shall be in writing and in the form of surety guarantee provided. The successful bidder will be required to furnish the statutory performance bond in the amount of his bid, approved as to form by the Authority counsel and as to sufficiency by the Authority.

The Authority reserves the right to consider bids for thirty (30) days after their receipt before awarding any contract and the right is reserved to accept any bid or to reject any or all of them.

EWING-LAWRENCE SEWERAGE AUTHORITY
Wilfred F. Predhome (Chairman)
Joseph T. Barker (Vice Chairman)
Philip A. Smith (Treasurer)
John G. Brady (Secretary)
John E. Malone
Stephen J. Krol

Buck, Seifert and Jost
Consulting Engineers

Dated: January 18, 1960

Bids: February 24, 1960

Narrows Bridge—Brooklyn Tower & Staten Island Tower

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Wednesday, February 24, 1960

For Narrows Bridge Contract No. NB-2B, Brooklyn Tower. The bid must be accompanied by a deposit in the amount of $250,000.

and

For Narrows Bridge Contract No. NB-2S, Staten Island Tower. The bid must be accompanied by a deposit in the amount of $250,000.

Bidders may submit bids for either one or both of the above contracts.

Plans, specifications and contract documents may be purchased at the office of the Authority for $25.00, which will not be refunded.

OFFICIAL PROPOSALS

Bids: February 18, 1960

The Sale of Salvage Rights At The Massena Canal (Alcoa) Power Plant Near Massena, St. Lawrence County, New York

POWER AUTHORITY OF THE STATE OF NEW YORK
ADVERTISEMENT FOR PROPOSALS
SPECIFICATIONS NO. PA-5-15081
ST. LAWRENCE CONTRACT NO. P 44

NOTICE TO CONTRACTORS: The Power Authority of the State of New York will receive sealed proposals from prospective purchasers of salvage rights at the Massena Canal (Alcoa) Power Plant, near Massena, St. Lawrence County, New York until 10:30 A.M. Eastern Standard Time on the 18th day of February, 1960, at the Authority's office, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at which time and place the proposals will be publicly opened and read aloud.

The principal items of equipment and material which the Salvage Contractor (purchaser of salvage rights(will be entitled to remove from the power plant site and which, after removal from the site, will become the property of the Contractor are as follows:

- 14 Generators, horizontal shaft, 500 volt, direct current:
  - 12 units rated at 4400 amperes—140 R. P. M.
  - 2 units rated at 7000 amperes—180 R. P. M.
- 4 Generators, vertical shaft, 500 volt, direct current, rated at 7000 amperes 100 R. P. M.
- 2 Generators, alternating current, 25 cycle, 2200 volts:
  - 1 unit with horizontal shaft, rated at 3750 K. W.—140 R. P. M.
  - 1 unit with vertical shaft, rated at 1240 amperes—100 R. P. M.
- 3 Overhead cranes, direct current electrically powered:
  - 2—15 ton capacity cranes; spans—29-feet and 38-feet 11-inches
  - 1—10 ton capacity crane; span—30-feet
- Approximately 1,800,000 lbs. of scrapped turbine equipment
- Approximately 550,000 lbs. of structural steel in crane supporting structures.
- Approximately 120,000 lbs. of cast iron floor plates.
- 6 Steel headgates, each approximately 10½ feet wide by 30 feet high.

Dependent on the schedule on which the contract for salvage rights is awarded, all equipment and material which the Contractor desires to salvage shall be completely removed from the power plant site and from adjacent Authority-owned land on or before one of the following dates:

Schedule No. 1:	May 31, 1960
Schedule No. 2:	June 30, 1960
Schedule No. 3:	July 31, 1960
Schedule No. 4:	August 31, 1960

Plans, specifications and Proposal Forms for the salvage rights may be obtained from the Power Authority of the State of New York, 18th Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, New York, at no cost, upon written application. Plans, Specifications and Proposal Forms for the salvage rights will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and may be inspected by prospective bidders during office hours.

Bids must be made and returned in duplicate in accordance with the instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 20 percent of the total amount of the bid.

The right is reserved to make award on any bid and to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

District of Columbia—Building Construction—Dept. of Bldgs. & Grounds, Jan. 13, 1960. CONSTRUCTION OF INCINERATOR NO. 4, FORT TOTTEN DRIVE AND HAWAII AVE. N.E., WASH., D. C. (INVITATION NO. C-60112-B). Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Rm. 404, 499 Pa. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 2378). SEALED BIDS to be opened 3:00 PM, EST, Feb. 17, 1960, in Rm. 424, 499 Pa. Ave., N.W.

OFFICIAL PROPOSALS

Bids: February 16, 1960

Narrows Bridge Cables and Suspenders

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office, Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 A.M. Tuesday, February 16, 1960

For Narrows Bridge Contract No. NB-3, Cables and Suspenders. The bid must be accompanied by a deposit in the amount of $500,000.00.

Plans, specifications and contract documents may be purchased at the office of the Authority for $25.00, which will not be refunded.

Bids: February 23, 1960

Sluce Gate and Stop Shutters

CONTRACT 467

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M., Eastern Standard Time on Tuesday, February 23, 1960, for Contract 467, for furnishing, testing, and delivering one 6-foot by 15-foot broome type sluice gate, three 6-foot by 15-foot stop shutters, and one stop shutter lifter, together with their appurtenances, complete in every respect and ready for installation in the Intake Works of the West Delaware tunnel, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of twenty-five thousand dollars ($25,000.00), for the proper execution of the Contract.

Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in the Secretary's office, Room 1312, at the above address, upon application in person or by mail, by depositing the sum of $5.00 for each pamphlet. Within 30 days following the award of contract or rejection of bids the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of $4.00 will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the Contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars apply at the office of the Chief Engineer at the above address.

ARTHUR C. FORD, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners; Board of Water Supply; BETTY COHEN, Acting Secretary.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal Advertising is $2.40 per line (or fraction) per insertion.

COPY RECEIVED: up to 10:30 A.M. Friday for issue out following Thursday subject to space open for last minute ads.

SEND COPY: to Official Proposal Division, Classified Adv. Div., P. O. Box 12, New York 36, N. Y.

EMPLOYMENT NATIONAL COVERAGE OPPORTUNITIES

DISPLAYED RATE:

The advertising rate is $39.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

An advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page.

Subject to Agency Commission.

FEBRUARY 11TH
ISSUE
CLOSES
FEBRUARY 1ST

UNDISPLAYED RATE:

$2.40 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Not subject to agency Commission.

Send NEW Ads and Inquiries to Classified Advertising Division or ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

PRODUCTION MANAGER

Metals Industry

For position as superintendent of industrial metals installation in Southeastern Penna., Mechanical or Civil Engineering background desirable. Experience in steel mill or foundry with heavy material handling equipment is helpful. This is #1 position with complete responsibility for local operation of national company. Send resume with salary desired to:

P-3508 Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ADDRESS BOX NO. REPLIES TO: Box No.
Classified Adv. Div. of this publication.
Send to office nearest you.
NEW YORK 36: P. O. Box 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

• POSITIONS VACANT

Sales Engineer: To represent expanding prestressed concrete plant in Southeastern Wisconsin area. Structural design background in building field considered helpful. Send complete resume and salary requirements to P-3492, Engineering News-Record.

Civil Engineer—capable of supervising civil engineering department in established consulting engineering firm. Experienced in water and sewerage facilities, municipal work and surveying. Must have sales and organizational ability to expand present department. Salary commensurate with ability. P-3495, Engineering News-Record.

One Chief of Party—Must be capable of handling survey parties and have thorough understanding of municipal survey work pertaining to rights of way, curb and street line and grade, sanitary and storm sewer survey plans and profiles, and general survey work. Apply for appointment—Office of Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

One Transit Man—For inside drafting room and outside field work. Must have thorough knowledge of engineering, drafting and calculating, and be thoroughly familiar with deed and conveyance, and tax map work. Apply by appointment—Office of Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

Two Jr. Engineering Aides or Chainmen—To work in survey parties. Apply by appointment—Office of Township Engineer, 1 Main Street, Woodbridge, N. J., between 9 A.M. and 5 P.M.

Plant Superintendent for Structural Steel, Fabricating and Erection Company—20,000 ton capacity. To take complete charge of fabrication of structural steel for commercial, institutional and industrial buildings in Eastern States. Minimum requirements five years experience, supervising shop employing approximately 100 personnel. Send complete resume, listing all employment, experience, education and salary requirements. P-3447, Engineering News-Record.

Mechanical Engineer—For permanent position in office of long established large Engineer-Architect firm. Must be experienced in all phases of mechanical design for schools, commercial and light industrial buildings including heating, plumbing and air conditioning. Send complete resume to Employment Manager, 3600 East Jefferson, South Bend 15, Indiana. All replies will be acknowledged.

Chief Estimator

Mechanical, chemical, civil, or electrical engineer on top management level thoroughly experienced in all types of piping and machinery installations.

Familiarity with rigging and millwright work is necessary.—Good opportunity to advance with well established firm.—The right man will be placed in full charge of his department.

Reply with resume of accomplishment. Salary open, replies confidential.

P-3553, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

• POSITIONS VACANT

Electrical Engineers—Competent to check design and to supervise installation for new construction and renewing old distribution in large steel mill. Some field design may be necessary. Long term project with Consulting Engineer. Apply by Air Mail sending brief resume of education and experience to Box 751, Whiting, Indiana.

Wanted—Civil Engineer or one who has had the equivalent training by practical experience. Must be familiar with the handling of sewer, water and paving projects and have $15,000.00 to $20,000.00 to invest in old established construction company. P-3422, Engineering News-Record.

Engineer—Draftsman—Surveyor: With small general contractor. Location, Ocean City, Maryland. Degree in engineering not required. Want man to assist in surveying, drafting, work on water and sewer plans, foundation layouts, assist in estimating, etc. under supervision of a registered professional engineer and surveyor. Salary 5 to 6 thousand. Submit resume' of experience and references to Geo. Bert. Cropper, Ocean City, Md.

Water Superintendent. Applications being accepted until February 15 for water superintendent to manage complete water works system. Includes 3 MGPD lime-soda ash treatment plant. Salary $6000. per annum. Age range 30-50. Send applications to I. L. Samuelson, City Engineer, Storm Lake, Iowa.

General Superintendent—Sewer, Water, Highway and Subdivisions, Southwestern Ohio. Write giving full resume to: P-3545, Engineering News-Record.

Highly qualified superintendents for major road construction and bridge construction in the north-easterly section of the Country. Give experience specifically and character and work references. P-3532, Engineering News-Record.

Estimator—Expanding Philadelphia Contractor has an opening for a man thoroughly experienced in competitive public bidding. Top pay and working conditions. Write for interview. P-3536, Engineering News-Record.

Wanted — Estimator-Engineer to take-off quantities on piping, ductwork, etc., for large insulation contractor in north Jersey. Apply The Trybee Co., 381 North Midland Avenue, Saddle Brook, N. J. SW 1-1170.

Deputy Building Inspector for Portland, Maine. Engineering or architectural degree with structual design, construction, or inspection experience. Salary range $6,108 to $7,308. Promotional opportunity. Apply Personnel Director, City Hall.

Contracting firm wants graduate engineers to work in Rocky Mountain area, must have previous construction experience. P-3318, Engineering News-Record.

• POSITIONS VACANT

Chief Estimator For Building Construction. National organization seeking topnotch man to take-off, price, purchase and sub-contract. Must have had experience with larger competitive builders in New York, Connecticut and General Eastern area markets. Should have following of subcontractors and tradesmen. Free to travel as required. Only fully qualified persons need apply. All applications will be held in strict confidence. Send complete resume of experience, qualifications and salary requirements to P-3569, Engineering News-Record.

• POSITIONS WANTED

Electrical Engineer, BEE, Reg PE, 37, 14 years diversified experience in industrial power and control, power distribution, and petroleum-electric fields. Will complete fourth foreign contract in March. Speaks French, Spanish. Seeks position with engineering-construction firm. PW-3352, Engineering News-Record.

Superintendent, Project Mgr., Proj. Engineer, age 48, heavy constr., water works, dams, refineries, grad. registered engineer, US citizen, speaks French, Spanish, German, Dutch, prefers foreign assignment. T. deBruyn, Rte. 1, Box 246-A, Las Vegas, Nevada.

Wanted: Employer in heavy construction civil eng., age 29, married, ambitious industrious very anxious to learn. PW-3316, Engineering News-Record.

Executive-Construction Equipment — Over thirty years experience in highway and heavy construction. Last 12 years head of equipment division of large heavy construction co. Have ability and experience to handle equipment specifications, purchasing, financing, accounting, management of large organization, and ability to cope with all maintenance problems regardless of the most difficult field conditions. PW-3451, Engineering News-Record.

Chief Highway Engineer—Broad experience in design and construction of expressways, parkways and municipal facilities. Registered P. E. in many States. Desires key position with engineering organization or contractor. Now located New England but will consider other locations in U. S. PW-3496, Engineering News-Record.

C. E. Executive. 8 years heavy, marine, pipeline, road, foreign construction and sales experience. Speak several languages. PW-3513, Engineering News-Record.

Construction Supt. General Construction. Would like to permanently relocate in the far west, or south west. 8 years with present Gen. Contr. in the east. Experience mostly schools. Cost conscious, experience in quantity surveys, cost reporting, and field engineering. Running school job at present time, PW-3471, Engineering News-Record.

Structural Engr.—MSCE—26—2 yrs. experience in structural design. Interested in consulting field. Foreign position acceptable. Resume' upon request. PW-3456, Engineering News Record.

Supt. or General Foreman—Age 43—Over 18 years experience highway construction supervising earthmoving equipment, excavating, drainage. Know men, methods and cost. Available at once. A-1 references. PW-3461, Engineering News-Record.

Construction Engineer, experienced in Water, Sewer and Gas lines, Water and Sewage Treatment plants, Street and Highway construction on Municipal, State and U. S. Gov. contracts. 4 years Civil Engineering, 6 years Estimator and Gen. Superintendent, 2 years Management. Rocky Mtn. area or Western U. S. PW-3465, Engineering News-Record.

(Continued on page 199)

General Construction PURCHASING AGENT

Must Qualify as Man Destined for Top Management

Position Responsibilities:

Complete and full charge of all contract, sub-contract and materials purchasing at the main office on all projects located within and without the continental limits of the United States.

Educational Background:

Preferably a graduate Civil Engineer with additional legal training.

Experience and Capabilities:

Should have extensive experience in General Construction purchasing primarily for the general construction field and, secondarily, in the heavy construction field, a knowledge of negotiation of sub-contracts and a good knowledge of straight and unit price bidding procedures. Must demonstrate ability to negotiate sub-contracts and material contracts for multi-million dollar projects and to assist project managers in the administration of these contracts.

Salary:

Excellent, fully commensurate with position responsibilities and the opportunity for continued professional advancement.

Please air mail complete resume to

P-3512, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

ENGINEERS
AND
MATERIALS INSPECTORS
WANTED

TVA has openings on a large hydro- and steam-electric program for experienced civil, structural, electrical, and mechanical engineers in its Division of Design located in Knoxville, Tennessee, and for materials engineers and inspectors of materials located in various district offices, principally in the north and east.

These positions are at the following grades and rates of pay:

Civil, Mechanical, Electrical, and Materials Engineers, grades SD-2 and -3 $6200-$7150.

Inspectors of Materials, grades SE-5 and -6 $5825-$6625.

The engineering jobs require a college degree in engineering or its equivalent with from one to three years of experience in design and specification work, or in inspection and testing work for materials engineers. The inspector of materials jobs require some college training in engineering or equivalent training and experience in making engineering inspection and tests of mechanical structural, and electrical equipment and materials.

All jobs carry automatic within-grade increases for satisfactory service, liberal vacation leave, sick leave, and retirement, hospitalization, and insurance benefits.

Write to:

TENNESSEE VALLEY AUTHORITY
Division of Personnel,
Knoxville, Tennessee

RESIDENT ENGINEER

CEMENT PLANT

INDIA

Require Executive Resident Engineer with experience in OPERATION and CONSTRUCTION of cement plants. Sole responsibility for review of design, overall construction and start-up of 100,000 TON annual output plant.

Degree desired; knowledge of cement chemistry necessary. Salary commensurate with position; Family transportation provided.

Write: PERSONNEL MANAGER

HENRY J. KAISER CO.
Heavy Construction Division
1924 BROADWAY
OAKLAND 12, CALIFORNIA

SALESMAN WANTED

Excellent opportunity with one of New York's oldest anl largest Distributors of Construction Equipment and Supplies, territory Long Island, Bronx and Westchester.

MAHONEY-CLARKE, INC.
217 Pearl Street New York 38, N. Y.

TOWN ENGINEER
Town of Montclair, N. J.

Suburban, Residential, Population 45,000

For supervision of engineering staff of Public Works Department; municipal construction, traffic engineering, reports, extensive contacts with public.

Requires engineering education and professional registration.

Salary range $8,000—$10,400.

Excellent working conditions.

Submit full details of background and salary requirements to General Superintendent of Public Works, Municipal Building, Montclair, N. J.

CIVIL or SANITARY ENGINEERS
—TWO—

- **Starting Salary Open**
- **Career Opportunity**
- **Consulting Firm of National Reputation**
- **Advancement potential Unlimited**
- **Work Varied**

Qualifications Desired: Top caliber men having engineering degree with minimum 8 years practical experiencc in planning, report writing, design and operation of sewage and industrial waste collection, treatment, and disposal facilities. Limited travel; location Pennsylvania area.

P-3239, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

WANTED
ENGINEERING ASSOCIATES

SANITATION WATER SUPPLY
    (foreign & domestic)
PETROLEUM (foreign)
GEOLOGICAL & MINING (foreign)
CHEMICAL & PETRO-CHEMICAL
    (foreign and domestic)
WATER RESOURCES (foreign)
HYDRO-ELECTRIC (domestic & foreign)
CONSTRUCTION (domestic & foreign)

President and Vice-President levels.
Complete charge of your own division.

Drawing account against substantial share of Division profits before tax PLUS income from own secured investment.

Minimum Investment $25,000.00

GLOBAL Activity—TOP Recognition

Send complete resume including photo to:

P. O. Box 968,
Station "B", Montreal, Quebec

ERECTION SUPERINTENDENT

Graduate Civil Engineer with General Contractor experience to supervise our Regional Erection Departments.

Complete knowledge of major construction practices, ability to cope with area labor problems and willing to travel are prime requirements. Age 35 to 50. Our products include Building Panels, Curtain Wall, Doors and Windows.

If you believe that you have the qualifications for this challenging job, please write fully, including salary requirements to—

FENESTRA INCORPORATED
2250 E. Grand Boulevard
Detroit 11, Michigan

CIVIL ENGINEER

Permanent new position for graduate civil engineer in the salary range of $511 to $588 a month (plus longevity pay). Candidates with outstanding qualifications may be hired above the minimum. Vacation, sick leave, dual pension program, and other fringe benefits. Must be U.S. citizen and possess an EIT certificate. Some related experience desired to work in design and construction of sewer, water, street, sidewalks, and curbs. Travel expenses paid on invitation and moving expenses paid for selected candidate. Personnel Dept., 404 City-County Bldg., Madison 9, Wisconsin.

CIVIL ENGINEER

City of Brookfield, Wisconsin is expanding its engineering department and will employ a graduate civil engineer with some background in municipal or consulting engineering. Must be available for employment prior to March 15, 1960.
Submit resume of experience and qualifications to

CITY ENGINEER
2000 North Calhoun Road, Brookfield, Wis.

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in Middle Atlantic States. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive salary with company car, expenses and bonus plan.

SW—2763 ENGINEERING NEWS-RECORD
Class. Adv. Div., P.O. Box 12, N. Y. 36, N. Y.

• POSITIONS WANTED

(Continued from page 197)

Civil Engineer—10 years experience general construction. Supervision, liaison, expediting, owners' representative. Some estimating. Married. Will relocate. Preferably West Coast. Resume available. PW-3479, Engineering News-Record.

Project Manager—Nuclear Power and Research Reactor experience, desires connection with architect-engineer-contractor. Currently employed by major reactor company. BSME-MIT; also CE-Georgia Tech. Regisered Engineer. Age-38. PW-3487, Engineering News-Record.

Construction Manager, hvy. const. Desires position with med. sized firm reasonably financed. Engr. background, age 41, exper. U. S. & O.S. all types contracts. Excellent contacts. Good following of personnel. Now employed. Available 90 days. PW-3437, Engineering News-Record.

General Supt. 43, 20 years experience on heavy industrial, commercial, chemical and institutional work. Engineering background. PW-3440, Engineering News-Record.

Attention General Contractors: Chief Estimator and/or Project Manager available for immediate connection. Proven record of four to six million volumn per year in strict competition. Minimum, salary required $12,000.00 per year. Contact William C. Dick, 3507 Cardinal Blv'd., Daytona Beach, Florida. Phone—Clinton 3-9955.

Reinforcing Steel Estimator-Detailer, twelve years. Three years supervisory. To locate West or Southwest. PW-3397, Engineering News-Record.

Registered Engineer 20 yrs. experience, can assume immediate full charge all phases of water or sewer projects any size; U.S. or foreign. PW-3401, Engineering News-Record.

Construction Supt. 32 years of construction experience in Commercial, Public and Industrial. Will assume responsibility with integrity. Location preference Southeast—best references. PW-3144, Engineering News-Record.

M.S.C.E. 31, amrried, U. S. citizen 9 years progressive structural design experience in bridges, tunnels and industrial plants desires employment abroad (with family) prefer Australia. Resume upon request. PW-3243, Engineering News-Record.

Soils Engineer—MCE, P. E. Age 28 experienced in testing, analysis, design and construction. Resume on request. PW-3568, Engineering News-Record.

Project Manager, B.S.C.E., 16 yrs. exp., hvy. Const., Hwys., flood control, earthwork, bldgs., Govt. contracts, field & office. E. Eiswirth, P. O. Box 48 Clayton 5, Mo.

Heavy & highway grade Superintendent full charge, engineering estimating experience. PW-3544, Engineering News-Record.

Project-Manager 23 yrs. exp. heavy constr. major U. S. & O. S. projects, bridges, waterfront, highways, earthwork, etc. Top references. PW-3529, Engineering News-Record.

Representative familiar Canadian market desires position reliable manufacturer. PW-3520, Engineering News-Record.

Project Manager or General Supt. Excellent record on Multi-Million Dollar projects. Airports, heavy and highway. All phases from letting through final estimate, sub-contracts, and negotiations with Corps of Engineers. Complete Supervisory following available. Prefer Western United States. Available for interview. PW-3527, Engineering News-Record.

Civil Engr. 33. Diversified experience in construction as supt. and with general consulting firm. Desires position in Engineering with profit sharing or partnership arrangements. Midwest, West or Southwest preferred. Reg. Engr. and Reg. Land Surveyor. PW-3531, Engineering News-Record.

Construction Supt. and Eng. P.E. Hvy. Earthwork, Highways, Air Ports. Supervising, 15 yrs. exp. prefer South, Caribbean or Central America. avail. now. PW-3550, Engineering News-Record.

Construction man, grad. engineer 40, former contractor, experienced public work and heavy construction. PW-3549, Engineering News-Record.

High caliber engineer-estimator-executive, 32, seeks position with heavy/or building contractor, North Jersey area. P.O. Box 71 Hohokus, N. J.

Heavy Const. Field Engineer. Layout Specialist. 9 yrs paper mill and chemical plant experience. Age 29, 2 yrs college. PW-3560, Engineering News-Record.

SEARCHLIGHT SECTION

CLASSIFIED ADVERTISING

BUSINESS OPPORTUNITIES - EQUIPMENT - USED or RESALE

DISPLAYED RATES

The advertising rate is $25.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vest. on one col., 3 columns—30 in. to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

UNDISPLAYED RATES

$2.40 a line, min. 3 lines. To figure advance payment count 5 average words as a line.

BOX NUMBERS count as one additional line in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads.

STRUCTURAL ENGINEERING

ARCHITECTURAL ENGINEERING

OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-eighth year.

[illegible] obligation

WILSON *Engineering Corp.*

College House Offices HARVARD SQ., CAMBRIDGE MASS.

CONSTRUCTION SUPERVISION

Exclusive Training Course by mail for top positions. Publishers Manual of Advanced Construction Management. Send postcard for details.

National Schools of Construction
Est. 1952
Satsuma, Florida

NEW 1954 AUSTIN-WESTERN PORTABLE CRUSHING PLANT—MODEL 101

10 x 36 Jaw, 30 x 18 Roll, 4 x 12-3D Screen, 144 HP Murphy diesel power, mounted eight rubber tires.

R. C. STANHOPE, INC.
60 E. 42nd St. Tel. MU-2-3076
New York 17, N. Y.

SEWAGE LIFT STATION EQUIPMENT

Good Condition

1—Duplex Set of Yeomans "Expelsor" pneumatic ejectors including duplex ejectors including duplex compressors, piping, gate, check valves, air tank, magnetic starters, alternator, and controls. Capacity each unit, 150 GPM at 14 feet of head.

Location: Highland Park, Illinois

Write

MANILOW CONSTRUCTION CO., INC.
3520 Western Avenue, Highland Park, Ill.

FOR SALE

PRICED VERY LOW—REAL BARGAIN

1—3000 B Manitowoc—Used 1300 hrs.—Torque Convertor—18'4"—Cats—100 Ft. Boom—30 Ft. Jib
1—51—B. E. Shovel 2½ yd bucket—Used 10 Months
1—DW 21—Double Stack.

D. C. SMITH
605 Fifth Ave., Pelham, New York Pa. 8-2336

WANTED

Tubular Material Tower double well/buckets & hopper.

Archer type preferred.

MILLER & LONG CO., INC.
5506 Connecticut Ave., N. W.,
Washington 15, D. C. Wo-6-2629

• SPECIAL SERVICE

Steel Products Engr. Co.—Reinforcing Steel Detailing—16525 Woodward Avenue Highland Park 3, Michigan.

• WANTED

Anything within reason that is wanted in the field served by Engineering News-Record can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

FOR SALE

CONSTRUCTION COMPANY WITH 1/5 MILLION DOLLAR TAX LOSS

Assets: Machinery, equipment, small tools. All in good condition. Owners guarantee of liability. Now actively operating in Florida in sewer and water lines.

Cash requirements for purchase of stock and sales price, $40,000.00, and must assume approximately $80,000.00 current liabilities and $80,000.00 in notes payable to bank, or approximately $200,000.00. Approximately $250,000.00 in assets involved.

This is an excellent purchase for company reasonably assured of profitable 1960 business and wanting to set up operations in rapidly growing South Florida.

Respondents please submit brief outline of business and financial status after which additional information will be furnished.

BO-3505, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

PIPE

Surplus New & Used

FOR SALE, WANTED OR RENT

Call: HYACINTH 7-4900

PIPE, VALVES & FITTINGS

PILING • CULVERTS • ASBESTOS-CEMENT PIPE • ALUMINUM PIPE

ALBERT PIPE SUPPLY CO., Inc.
103 VARICK AVE., BROOKLYN 37, N.Y.

ASSOCIATED PIPE & FITTING CO., INC.

PILING PIPE SHELLS MANDREL FITTINGS

"H" BEARING PILE SLEEVES AND SHOES

K & M ASBESTOS CEMENT PIPE

CULVERTS CIRCLE ARCH SECTIONAL

262 RUTHERFORD BLVD., CLIFTON, N.J. • PR 3-8400

PIPE

500,000 ft. 10¾" O.D. 35#
200,000 ft 12¾" O.D. 40#
200,000 ft 8⅝" O.D. 28#
20,000 ft 16" O.D. 42#
All Machine Cleaned. Plain End. No. 1 Grade.

INDIANA-OHIO PIPE CO.
P.O. Box 5412 Shepard Sta. Phone CL. 3-5527
COLUMBUS 19, OHIO

STEEL PIPE up to 48" O.D.

WELDING FITTINGS
FLANGES • VALVES

The IDEAL SUPPLY CO.

445 Communipaw Ave.
Jersey City, N. J., DElaware 3-2600
New York Phone: DIgby 9-2454

PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN - TERRY
Steam Pile Hammers and Extractors

- DROP HAMMERS
- DRIVING CAPS
- HOISTS AND BOILERS
- STEEL LEADS
- PILE DRIVER HOSE
- STEEL SHEET PILING

CONMACO, INC.

DRexel 1-3930
820A KANSAS AVE.,
KANSAS CITY, KANS.

FOR SALE

1—Used Lima Model 1201, New Cummins Engine and Undercarriage Rebuilt in 1958

1—Used Garwood Buckeye Trencher Model 407. New in 1958

1—Used Manitowoc 3900

1—Used Manitowoc 3500

MANITOWOC-FORSYTHE CORPORATION
37-11 Vernon Blvd.—EXeter 2-6125
Long Island City 1, New York

FOR SALE

48B Bucyrus Erie Shovel, diesel 2½ c.y.
3540' 9" x 9" road forms
1800' 11" x 13" airport forms
2500' 16" x 12" airport forms

WILLIAMS CONSTRUCTION COMPANY
Box 5045 Balto. 20, Md. Murdock 6-1000

PUMPCRETE

Current Models Sale or Rent
Engineering Service & Parts
R. T. SHERROD
Concrete Equipment Company
Jones Island, Milwaukee 7, Wis.

Stock to Prompt Delivery

New Tugs 45'—55'—65'—85'—105'
New Water Taxis 32'—38'—40'—51'—54'
New Barges 110' and 130'
Floating equipment of all types to our or your specifications.
Also many used items—tugs, barges, yachts and others. Advise your Needs

EQUITABLE EQUIPMENT CO., INC.
410 Camp St. New Orleans 12, La.

FOR SALE

1—1955 Haiss Heavy Duty Bucket Loader

Type—Wheel mounted—4 wheel drive Model —135 W-4
Size—8 cubic yards per minute rated capacity.

GOTHAM SAND & STONE CORPORATION
Box 269 Port Washington, New York PO 7-3860

PILING

SURPLUS NEW and USED **For Sale, Wanted or Rent**

We do a Nation-wide business in

STEEL SHEET PILING

IMMEDIATE SHIPMENT

815 pcs. 75 to 30 ft. Beth. SP-6a—New York
100 pcs. 62 ft. Beth. ZP-32—Connecticut
103 pcs. 60 ft. MZ-27—Tennessee
150 pcs. 60 ft. SP-4—W. Virginia
290 pcs. 60 to 30 ft. M-16 & M-115—Tennessee
370 pcs. 60 to 30 ft. M-115 & M-116—Indiana
150 pcs. 34-30 ft. M-116—Michigan
81 pcs. 25 ft. M-115—Mississippi
220 pcs. 15 ft. M-115—Missouri
Other lengths and sections at various locations. Storage yards at CHICAGO, BUFFALO & MEMPHIS.
Also 10" x 42# and 12" x 53# BP 60' in stock.

PILE DRIVING EQUIPMENT

VULCAN AND McKIERNAN-TERRY
PILE HAMMERS & EXTRACTORS
All Sizes—For Rent & Sale—Immediate Shipment

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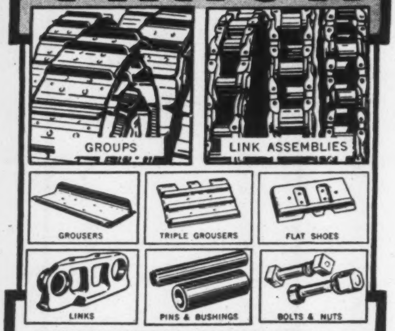

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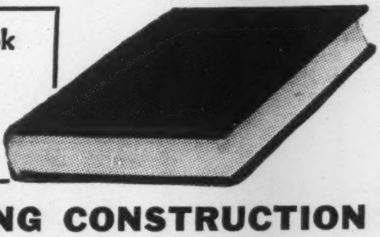

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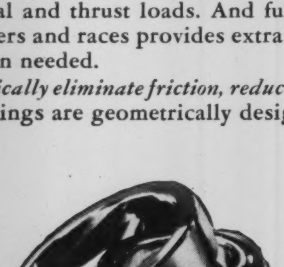

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